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U.S. DEPARTMENT OF AGRICULTURE

**MANUAL OF THE
GENUS *CAREX*
IN MEXICO
AND CENTRAL AMERICA**

**By
Frederick J. Hermann
Curator, Forest Service Herbarium**

**Agriculture Handbook No. 467
FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE**

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SUMMARY

Carex, of the family *Cyperaceae*, is the largest genus of vascular plants in North America, where it comprises over 600 species, and is taxonomically one of the most difficult genera in the flora of that region. It is partial to temperate and cold climates and therefore in predominantly tropical areas, such as Mexico and Central America, is largely restricted to high elevations.

In this taxonomic treatment, the 102 recognized taxa comprise 94 species, 7 varieties and one form,—more than double the number of taxa previously reported from the area in the only recent coverage of the genus for North America.

Keys for the identification of the sections of the genus and for the species are provided, as well as detailed descriptions, synonymy, accounts of geographic distribution and habitats, and illustrations for each species, many of which have never been illustrated before. Included are a systematic list of the taxa, a glossary, and bibliography.

Two new combinations are proposed: *Carex schiedeana* Kunze var. *perstricta* (Mack.) F.J. Herm. and *C. schiedeana* var. *stellata* (Mack.) F.J. Herm.

This Agriculture Handbook is a companion volume to Agriculture Handbook No. 374, Manual of the Carices of the Rocky Mountains and Colorado Basin (1970).

Hermann, Frederick J.

1974. Manual of the genus *Carex* in Mexico and Central America. U. S. Dep. Agric., Agric. Handb. No. 467 219 p., illus.

An original treatment of the 102 taxa of the genus *Carex* (family Cyperaceae) now known from Mexico and Central America. Detailed descriptions, keys for identification, and illustrations for each species are included.

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Issued December 1974

INTRODUCTION

Three factors have indicated the need for an up-to-date treatment of the sedges of Mexico and Central America: (1) The number of taxa (102) now known from the area is considerably more than double that recorded by Mackenzie in *North American Flora*, 1931-35, (2) The genus is a particularly large and taxonomically difficult one, meriting a specialized treatment, including keys for identification, pertinent synonymy, detailed descriptions, habitat preference and altitudinal range, and general and local distribution, (3) There has been no regional account, restricted to the species of the area, and including detailed drawings of the many species never before illustrated, to facilitate the problem of identification of collections from the area. It is hoped that this Handbook may contribute to the understanding of the variation in the many wide-ranging sedges of the United States whose distribution extends south of its border.

All pertinent literature has been reviewed and all collections from the area in the principal Mexican herbaria have been studied, as well as those in the larger herbaria of the United States known to be rich in material from Mexico and Central America (the Field Museum, Gray Herbarium, and the University of Michigan). In addition, many specimens were received from collectors who have recently been active in the region. The type collections of all species originally described from Mexico or Central America have been examined.

Permission to use some of Creutzberg's drawings in Mackenzie's "North American Cariceae" was generously granted by the New York Botanical Garden, to supplement those by Feddema and others published in U.S. Dep. Agric., Agricultural Handbook No. 374, "Manual of the Carices of the Rocky Mountains and Colorado Basin." Species originally described from specimens originating in Mexico and Central America but not heretofore illustrated are represented by plates expertly drawn for the present treatment by Jeanne R. Janish.

Because *Carex* is a genus largely restricted to a temperate or cold climate, its occurrence in Mexico and Central America is rare except in the mountains. Since many of the montane areas have not yet been well explored botanically, it is expected that further collections will disclose species not included in the present list.

MEXICAN AND CENTRAL AMERICAN CARICES— SYSTEMATIC LIST

(Numbers of sections and species in parentheses are those of K. K. Mackenzie in North American Flora, vol. 18. Interpolated species, subsequently reported from North America or recently described, are given decimal numbers following their nearest allies. Varieties are designated alphabetically.)

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KEY TO SECTIONS

1. Spike solitary.
 2. Stigmas 2; achenes lenticular.....1. CAPITATAE
 2. Stigmas 3; achenes trigonous.....10. FILIFOLIAE
1. Spikes more than 1.
 3. Stigmas mostly 2; achenes lenticular.
 4. Lateral spikes short, sessile; terminal spike androgynous or gynaeandrous.
 5. Culms arising singly or a few together from long-creeping rhizomes.
 6. Perigynia not granular-tuberculate, about 10 to a spike and largely concealed by the scales.....2. DIVISAE
 6. Perigynia granular-tuberculate, few to a spike, not concealed by the scales.....3. POTOSINAE
 5. Culms cespitose or the rhizomes short-prolonged and with short internodes, but not long-creeping.
 7. Spikes androgynous.
 8. Perigynia abruptly contracted into a beak.
 9. Spikes few (generally 10 or less, often greenish); sheaths not red-dotted ventrally.....4. BRACTEOSAE
 9. Spikes numerous, usually brownish or yellowish; leaf-sheaths often red-dotted at the mouth ventrally.....5. MULTIFLORAE
 8. Perigynia tapering into a beak.....6. VULPINAE
 7. Spikes gynaeandrous.
 10. Perigynia without winged margins, at most thin-edged.
 11. Perigynia spreading or ascending at maturity..7. STELLULATAE
 11. Perigynia appressed.....8. DEWEYANAE
 10. Perigynia with winged margins.....9. OVALES

4. Lateral spikes peduncled or, if sessile, elongated; terminal spike staminate, rarely gynaeandrous or androgynous.
12. Spikes androgynous, more or less paniculate..
.....25. FECUNDAE
12. Spikes, or some of them, staminate, pistillate or gynaeandrous, not paniculate.
13. Lowest bract long-sheathing; perigynia whitish-pulverulent at maturity; plants low, usually 5 dm. or less high.....
.....16. BICOLORES
13. Lowest bract usually sheathless, occasionally short-sheathing; perigynia not pulverulent; taller plants, usually more than 5 dm. high.....27. ACUTAE
3. Stigmas mostly 3; achenes trigonous.
14. Perigynia pubescent, puberulent, or ciliate-scabrous.
15. Style jointed with the achene, at length withering and deciduous.
16. Achenes with sides convex above, closely enveloped in the upper part of the perigynium-body; bracts of the non-basal, pistillate spikes sheathless or nearly so.....
.....11. MONTANAE
16. Achenes with flat or concave sides.
- 17. Bracts sheathless or the lower short-sheathing.
18. Spikes androgynous, the lower paniculate..13. SCHIEDEANAE
18. Spikes not androgynous, not paniculate.
19. Achenes closely enveloped, filling the perigynium body, the latter strongly trigonous
.....12. TRIQUETRAE
19. Achenes more loosely enveloped, the upper part of the perigynium-body empty, the latter obscurely trigonous..
.....19. LONGICAULES
17. Bracts, at least the lower ones, long-sheathing.....14. SCABRELLAE
15. Style continuous with the achene, indurated and persistent.....28. HISPIDAE
14. Perigynia glabrous.
20. Style jointed to the achene, not indurated, at length withering.
21. Lower bracts, at least, long-sheathing.

- 22. Upper and lower spikes all androgynous, the lower paniculate.15. INDICAE
- 22. Upper spike or spikes staminate or gynaeandrous, the others pistillate; spikes not paniculate.
 - 23. Perigynia with beak entire or emarginate or obliquely cut, at length bidentulate or bidentate.
 - 24. Pistillate spikes short, oblong to linear, erect or, if drooping, the spikes short and the perigynia acutely trigonous.
 - 25. Perigynia tapering at the base, trigonous; achenes closely enveloped . . .17. LAXIFLORAE
 - 25. Perigynia rounded at the base, suborbicular in cross-section; achenes loosely enveloped18. GRANULARES
 - 24. Pistillate spikes elongate, linear to cylindric, slender-peduncled, the lower drooping.
 - 26. Lateral spikes androgynous, often in pairs20. VIRIDIFLORAE
 - 26. Lateral spikes not androgynous, not in pairs21. SYLVATICAE
 - 23. Perigynia with beak bidentate.
 - 27. Perigynium-beak obliquely cut, at length bidentate22. LONGIROSTRES
 - 27. Perigynium-beak equally bidentate.23. EXTENSAE
- 21. Lower bracts sheathless or very short-sheathing.

- 28. Leaves more or less pubescent, at least toward the base.
- 29. Perigynia beaked, the orifice bidentate19. LONGICAULES
- 29. Perigynia beakless, the orifice entire or emarginate...24. VIRESCENTES
- 28. Leaves glabrous throughout.
- 30. Spikes numerous, adrogynous, often paniculate.....25. FECUNDAE
- 30. Spikes gynaeandrous (the lateral with few staminate flowers), not paniculate....60. ATRATAE
- 20. Style continuous with the achene and of the same bony texture, not withering.
- 31. Leaves not septate-nodulose; perigynia nerveless or nearly so, not ribbed or strongly nerved.....28. HISPIDAE
- 31. Leaves septate-nodulose; perigynia strongly nerved or ribbed.
- 32. Perigynia finely and closely ribbed29. PSEUDOCYPHEREAE
- 32. Perigynia coarsely ribbed.
- 33. Perigynium-body obovoid or obconic, truncately contracted into the prominent beak.....30. SQUARROSAE
- 33. Perigynium-body ovoid or globose-ovoid, not truncately contracted31. VESICARIAE

KEY TO SPECIES

1. CAPITATAE

One species.....1. *C. capitata*

2. DIVISAE

One species.....2. *C. praegracilis*

3. POTOSINAE

One species.....3. *C. potosina*

4. BRACTEOSAE

1. Beak of perigynium only minutely bidentulate, obliquely cleft dorsally; spikes with few (1-6, rarely 10), erect or ascending perigynia.....4. *C. vallicola*
1. Beak of perigynium bidentate, usually strongly so.
 2. Inflorescence ovoid, oblong-ovoid, or suborbicular, the spikes densely capitate.....5. *C. involucrella*
 2. Inflorescence oblong or linear-oblong to elongate and interrupted, not capitate.
 3. Scales about the length of, and wider than, the perigynia, and largely concealing them....6. *C. occidentalis*
 3. Scales shorter and narrower than the perigynia, not concealing them.
 4. Mature perigynium bulging dorsally, displacing the thickened margins onto the ventral face.....
.....4a. *C. vallicola* var. *hidalgensis*
 4. Mature perigynium not distended dorsally, the margins not displaced.....7. *C. xalapensis*

5. MULTIFLORAE

1. Scales strongly white-hyaline-margined....8. *C. agrostoides*
1. Scales little if at all hyaline-margined.
 2. Perigynia plano-convex, 3.5-4 x 1.5-2 mm., obscurely nerved ventrally, the beak one-half the length of the body; sheaths short-prolonged and high-convex at the mouth...

-9. *C. marianensis*
 2. Perigynia unequally biconvex, 4.5 x 2.25–2.5 mm., strongly
 ribbed and sulcate on both faces, the beak one-fourth the
 length of the body; sheaths not obviously prolonged at the
 mouth.....10. *C. percostata*

6. VULPINAE

- One species.....11. *C. chihuahuensis*

7. STELLULATAE

1. Perigynium-beak very shallowly bidentulate, one-fourth to
 one-third the length of the body, the ventral false suture
 inconspicuous.
 2. Perigynia ventrally nerveless or few-nerved only at the
 base.....12. *C. interior*
 2. Perigynia conspicuously nerved ventrally.....
12a. *C. interior* f. *keweenawensis*
 1. Perigynium-beak sharply bidentate, one-third the length of
 to equaling the body, the ventral false suture conspicuous.
 3. Perigynia ovate, abruptly short-beaked, the beak less than
 half the length of the body.....13. *C. townsendii*
 3. Perigynia lanceolate, tapering into a beak more than half
 of to about the length of the body.....14. *C. angustior*

8. DEWEYANAE

- One species.....15. *C. bromoides*

9. OVALES

1. Bracts not conspicuously exceeding the head (except rarely
 in *C. brevior*), usually inconspicuous.
 2. Beak of perigynium slender and nearly terete, scarcely
 margined at the tip, the upper 0.25–2 mm. of its length,
 little if at all serrulate.....1. FESTIVAE
 2. Beak of perigynium flat and margined to the tip, serrulate
 to the apex.
 3. Scales shorter than the perigynia, noticeably narrower
 above and largely exposing the perigynia.
 4. Wing of perigynium not narrowed near the middle
 of the body; leaf-blades of the sterile culms erect or
 ascending, usually clustered toward the apex; sterile
 culms often poorly developed.
 5. Perigynium-body not obovate, widest near the
 middle or base.....2. FESTUCACEAE
 5. Perigynium-body obovate, widest near the top....
3. ALATAE

4. Wing of perigynium rather abruptly narrowed near the middle of the body; leaf-blades of sterile culms widely spreading, numerous, not clustered at the apex; sterile culms strongly developed.....4. TRIBULOIDEAE
3. Scales about the length of the perigynia and nearly the same width above, nearly concealing the perigynia above.....5. FOENEAE
1. Bracts conspicuously exceeding the head.....6. ATHROSTACHYAE

Subsection 1. Festivae

1. Perigynia much flattened, rather thin and scale-like except where distended by the achene; inflorescence a short, dense head.....16. *C. volcanica*
1. Perigynia plano-convex, not thin and scale-like.
 2. Rootstocks elongate and conspicuously creeping, slender but tough; inflorescence moniliform or an elongate, loose head.
 3. Perigynia lanceolate or narrowly ovate, round-tapering at the base, the beak half the length of the body or more.....17. *C. bonplandii*
 3. Perigynia ovate, rounded at the base, the beak proportionately shorter.....18. *C. purdiei*
 2. Rootstocks short-prolonged, the culms cespitose; inflorescence capitate.....19. *C. subbracteata* var. *tolucensis*

Subsection 2. Festuceae

1. Perigynia plano-convex to concavo-convex, thick, coriaceous, subcoriaceous or submembranaceous, 3.5–5.5 mm. long.
 2. Scales little, if at all, reddish-brown-tinged...21. *C. brevior*
 2. Scales strongly reddish-brown- or chestnut-brown-tinged.
 3. Perigynia with beak entire or bidentulate, the body inconspicuously finely nerved or nerveless dorsally; rootstocks long-creeping; culms slender...22. *C. peucophila*
 3. Perigynia with beak bidentate, the body strongly nerved or ribbed dorsally; rootstocks short, stout; culms coarse.....20. *C. diehlii*
1. Perigynia flat, except where distended by the achene, thin, membranaceous.....23. *C. egglestonii* var. *festivelliformis*

Subsection 3. Alatae

- One species.....24. *C. longii*

Subsection 4. Tribuloideae

- One species.....25. *C. tribuloides*

Subsection 5. Foeneae

One species.....26. *C. xerantica*

Subsection 6. Athrostachyae

One species.....27. *C. athrostachya*

10. FILIFOLIAE

1. Spikes with 15–40 perigynia, beak of perigynium sharply bidentate.
2. Beak of perigynium short (0.5 mm.); pistillate scales obtuse; spikes short (2.5–4 cm.); leaves linear, 1.5–2 mm. wide.....28. *C. arsenii*
2. Beak of perigynium long (1 mm.); pistillate scales aristate; spikes longer (up to 6 cm.); leaves setaceous, 0.5 mm. wide.....29. *C. longissima*
1. Spikes with 2–15 perigynia; beak of perigynium obliquely cut; leaves 1.5–2 mm. wide.....30. *C. oreocharis*

11. MONTANAE

1. Fertile culms all alike, elongated, 5–50 cm. long, bearing both staminate and pistillate spikes; basal spikes absent.
2. Perigynium-body (excluding stipitate base and beak) narrowly obovoid, much longer than wide.....31. *C. physorhyncha*
2. Perigynium-body (excluding stipitate base and beak) nearly globose, about as long as wide.
3. Perigynium-beak shallowly bidentate, the body many-nerved; pistillate scales obtuse to cuspidate, reddish-brown-tinged; staminate scales strongly reddish-brown-tinged; culms slender.....32. *C. turbinata*
3. Perigynium-beak deeply bidentate, often ciliate, the body many-ribbed; pistillate scales acuminate to short-awned, light-colored; staminate scales greenish-white, slightly or not at all reddish-brown-tinged; culms strict.....33. *C. leucodonta*
1. Fertile culms of two types, some short, 1–5 cm. long, partly hidden among the densely tufted leaf-bases and bearing only pistillate spikes, others elongated, 5–12 cm. long and bearing both staminate and pistillate spikes.....34. *C. geophila*

12. TRIQUETRAE

1. Long-peduncled basal pistillate spikes not present; perigynia obscurely, if at all, nerved; pistillate scales copper-red.....35. *C. triquetra*
1. Long-peduncled basal pistillate spikes numerous, perigynia

finely many-ribbed; pistillate scales greenish-white.....
36. *C. planostachys*

13. SCHIEDEANAE

1. Leaf-blades and culms strongly vesicular-roughened above, glaucous-green, the margins often strongly revolute; perigynia oblong-obovoid, 1–1.25 mm. wide.....
37a. *C. schiedeana* var. *perstricta*
1. Leaf-blades not vesicular-roughened above, light-green; perigynia 1.25–1.75 mm. wide.
 2. Perigynia obovoid, 1.75 mm. wide, strongly white-hispid-hirsute, the beak bidentate; leaf-blades flat or channeled at the base, the margins little or not at all revolute.....
37. *C. schiedeana*
 2. Perigynia oval-obovoid, 1.25–1.5 mm. wide, white-stellate, short-hispid, the beak emarginate; leaf-blades with revolute margins.....37b. *C. schiedeana* var. *stellata*

14. SCABRELLAE

One species.....38. *C. scabrella*

15. INDICAE

1. Spikes very numerous, widely spreading, in 6–10 panicles, the upper panicles in pairs; perigynia prominently beaked.
2. Mature perigynia (3.5) 4–5 mm. long; achenes 3–3.25 mm. long; pistillate scales 3.4–5 mm. long; style very short, thickish.
3. Perigynia obscurely few-nerved, except for the two prominent lateral nerves, the beak emarginate, obliquely cut, hyaline, papery; pistillate scales chestnut-brown..
39. *C. humboldtiana*
3. Perigynia strongly many-nerved, the beak bidentate, not hyaline; pistillate scales pale-brown or reddish-streaked
40. *C. standleyana*
2. Mature perigynia 2.3–3.5 mm. long; achenes 1.5–2 mm. long; pistillate scales 2–3 mm. long.
 4. Scales acuminate to strongly awned, light reddish-brown or straw-colored; spikes oblong-ovoid to linear-oblong; perigynia finely many-nerved, the beak greenish, strongly bidentate; style long, rather slender.
 5. Perigynia glabrous; scales acuminate or with an awn 1–2 mm. long.....41. *C. polystachya*
 5. Perigynia hispidulous; scales acuminate or with an awn 1–10 mm. long.41a. *C. polystachya* var. *bartlettii*
 4. Scales obtuse, acute or the lower short-awned, dark reddish-brown; spikes oblong-ovoid or suborbicular; peri-

gynia less strongly nerved, the beak strongly reddish-brown-tinged, rather shallowly bidentate; style very short, thickish.

6. Leaf-blades 2.5–5 (10) mm. wide; perigynia elliptic-obovoid, 1–1.25 mm. wide, conspicuously nerved, the orifice hyaline, papery, the teeth often poorly defined42. *C. aztecica*

6. Leaf-blades averaging 15 cm. wide; perigynia broadly ovoid or subglobose, 1.5–2 mm. wide, very faintly nerved, the orifice not hyaline, the teeth distinct.....43. *C. hultenii*

1. Spikes rather few, appressed-ascending, in 1–3 panicles, none in pairs; perigynia short-beaked, the beak minutely bidentate; style very short, thickish.....44. *C. madrensis*

16. BICOLORES

- One species.....45. *C. hassei*

17. LAXIFLORAE

- One species.....46. *C. laxiflora* var. *serrulata*

18. GRANULARES

1. More or less caespitose; rootstocks moderately stout, dark-brown; ligule prolonged, acuminate; spikes short (the terminal 6–15 mm., the lateral 5–14 mm. long), the lateral not staminate at the apex; scales short (2 mm.), half the length of the perigynia; perigynia tapering into the beak; style-base not bent.....47. *C. atractodes*
1. Densely caespitose; rootstocks slender, pale-brown; ligule not conspicuously prolonged, blunt; spikes long (the terminal 14–25 mm., the lateral 20–30 mm. long), the lateral often staminate at the apex; scales 3 mm. long, nearly equaling the perigynia; perigynia abruptly beaked; style-base sharply bent.....48. *C. quichensis*

19. LONGICAULES

1. Pistillate (lateral) spikes linear, 2.5–3 mm. wide; perigynia 2.5–3.5 mm. long, elliptic-lanceolate or oval-obovoid, glabrous or the margins and beak sparsely pilose.
2. Spikes long (7–20 mm.), slender, many (10–25)-flowered, the terminal androgynous or staminate, the lowest strongly peduncled; perigynia glabrous, green, the lateral ribs not prominent, abruptly contracted into a smooth, short (0.5 mm. long) beak; achenes sessile.....49. *C. anisostachys*
2. Spikes short (4–12 mm.), stouter, few (5–12)-flowered,

- sessile or subsessile, the terminal usually gynaeandrous; perigynia sparsely pilose, red-dotted, the lateral ribs prominent, tapering into an often ciliate beak one-third to one-half the length of the body; achenes short-stipitate50. *C. guatemalensis*
1. Pistillate (lateral) spikes oblong or linear-oblong, 4–6 mm. wide; perigynia 3.5–4 mm. long, ovoid or obovoid, pubescent or glabrous.
 3. Perigynia and scales glabrous or nearly so, the beak bidentate or bidentulate; leaf-blades sparingly pilose beneath51. *C. longicaulis*
 3. Perigynia strongly short-pilose, the beak strongly bidentate; scales sparingly pilose; leaf-blades strongly villous beneath52. *C. coulteri*

20. VIRIDIFLORAE

1. Perigynia abruptly beaked (the beak praemorse), conspicuously stipitate, largely concealed by the scales; leaves narrow (3–4 mm. wide)60. *C. caxinensis*
1. Perigynia tapering into the beak, sessile, conspicuous in the spikes.
 2. Leaves narrow, 2–6 mm. wide.
 3. Culms loosely cespitose, the rootstocks elongate; perigynia scarcely beaked54. *C. pertenuis*
 3. Culms densely cespitose, from a short rootstock; perigynia definitely beaked.
 4. Sheaths hispidulous (sometimes very minutely) dorsally.
 5. Leaf-blades channeled above and more or less keeled below, 2–4 mm. wide; perigynia 10–40, their beaks sparsely ciliate-serrulate, 0.6–0.8 mm. long53. *C. viridiflora*
 5. Leaf-blades nearly flat, 3.25–5.5 mm. wide, glabrous; perigynia 30–80, their beaks smooth, 1–1.5 mm. long55. *C. perlonga*
 4. Sheaths glabrous dorsally.
 6. Perigynia 3.5–4 mm. long, 2-nerved, sparsely strigose; leaves 5–6 mm. wide56. *C. mackenziana*
 6. Perigynia 3 mm. long, 2-ribbed and strongly 6–8-nerved, glabrous; leaves 2.5–4.5 cm. long, septate-nodulose57. *C. venosivaginata*
 2. Leaves broad, 5–24 mm. wide.
 7. Scales abruptly aristate; perigynia 3.5 mm. long; leaves 5–15 mm. wide58. *C. huehuetica*
 7. Scales acute, muticous or inconspicuously mucronate; perigynia 5 mm. long; leaves 16–24 mm. wide59. *C. steyermarkii*

21. SYLVATICAE

One species.....61. *C. conspecta*

22. LONGIROSTRES

One species.....62. *C. tunimanensis*

23. EXTENSAE

One species.....63. *C. distentifformis*

24. VIRESCENTES

1. Culms from woody, elongate rootstocks, becoming decumbent; perigynia 3 mm. long, strongly ribbed dorsally.....64. *C. boliviensis*
1. Culms caespitose, erect; perigynia 2–2.5 mm. long, nerved dorsally.....65. *C. complanata*

25. FECUNDAE

1. Achenes, at full maturity, strongly constricted in the middle.
2. Perigynia obtusely trigonous, not oblique, the short beak straight.
3. Perigynia obovoid or broadly obovoid, 2–3 mm. long, 1.5–2 mm. wide, prominently 2-keeled, otherwise nerveless.
4. Spikes all androgynous; perigynia obovoid, strongly purple-resinous, the beak bidentate; achenes oblong-obovoid; spikes 3–6 cm. long; lower sheaths usually cinnamon-brown.....66. *C. tuberculata*
4. Upper spikes staminate or nearly so; perigynia broadly obovoid, obscurely resinous, the beak shallowly bidentate; achenes obovoid; spikes 3–10 cm. long; lower sheaths usually reddish-purple.....66a. *C. tuberculata* var. *ehřenbergiana*
3. Perigynia elliptic obovoid, 3–3.5 mm. long, 1.5 mm. wide.
5. Spikes 8–12; perigynia finely several-nerved as well as strongly 2-keeled, substipitate; leaf-sheaths yellowish-brown tinged and red-dotted.....67. *C. psilocarpa*
5. Spikes about 20; perigynia nerveless, strongly stipitate; leaf-sheaths reddish-brown.....68. *C. ballsii*
2. Perigynia compressed-triangular, oblique, the long beak somewhat excurved.....75. *C. jamesonii*
1. Achenes not constricted in the middle; perigynia compressed-triangular, oblique, the long beak somewhat ex-

- curved; perigynia nerved as well as 2-keeled (except in *C. cortesi* and *C. donnell-smithii*).
6. Achenes trigonous; stigmas 3; perigynia not hispid-serrulate (in *C. tojquianensis* sometimes minutely hispidulous above).
 7. Achenes oblong-ellipsoid, yellowish-brown.
 8. Bract-sheaths long-sheathing (up to 8 cm.); ligule wider than long; perigynium-beak obliquely cut, at most minutely bidentate.....70. *C. chiapensis*
 8. Bract-sheaths scarcely sheathing (rarely developing a sheath up to 1.7 cm. in *C. chordalis*); ligule much longer than wide; perigynium-beak clearly bidentate.
 9. Peduncles serrulate on the angles, shorter than the spikes; spikes 15-45, 2.5-15 cm. long; scales rough-awned or cuspidate.
 10. Perigynia nerved as well as 2-keeled; spikes linear-cylindric, 5-15 cm. long; lower sheaths usually cinnamon-brown.....69. *C. chordalis*
 10. Perigynia 2-keeled, otherwise nerveless or nearly so; spikes 2.5-7 cm. long; lower sheaths dull purplish-brown.....71. *C. cortesi*
 9. Peduncles smooth, longer than the spikes; spikes 3-4, 2-3.5 cm. long; scales obtuse to subacute.....72. *C. tojquianensis*
 7. Achenes oblong-obovoid, purplish-black at maturity; lower sheaths purplish-brown.
 11. Perigynia 2.5 mm. long, their beaks with very short teeth; spikes 2.5-7 cm. long; scales reddish-brown ..73. *C. melanosperma*
 11. Perigynia 3.5-5 mm. long, their beaks with slender teeth 0.5 mm. long; spikes 3-12 cm. long; scales purplish-black74. *C. donnell-smithii*
 6. Achenes lenticular; stigmas 2; perigynia hispid-serrulate above.....76. *C. lemanniana*

26. ATRATAE

- One species.....77. *C. bella*

27. ACUTAE

1. Perigynium-beak entire or slightly emarginate; achenes 1.5 mm. long.
2. Ligule much wider than long; sheaths glabrous ventrally; strongly septate-nodulose dorsally; long horizontal rootstocks numerous.....78. *C. emoryi*
2. Ligule as long as wide; sheaths hispidulous, only sparingly septate-nodulose dorsally; horizontal rootstocks short, stout.....80. *C. eurycarpa*

1. Perigynium-beak bidentulate; achenes 1.75 mm. long.
.....79. *C. endlichii*

28. HISPIDAE

1. Perigynia 3–4.5 mm. long, broadly obovoid, very abruptly short-beaked, obscurely few- to several-nerved, wider than, and not concealed by, the scales; achenes substipitate; lowest bract short-sheathing.
2. Perigynia squarrose-spreading, at maturity becoming inflated, glabrous; achenes elliptic-obovoid; style abruptly bent.81. *C. spissa*
2. Perigynia usually appressed-ascending, little or not at all inflated.
3. Perigynia glabrous, red-striolate; achenes elliptic-obovoid; style straight; scales acute to moderately short-awned.81a. *C. spissa* var. *ultra*
3. Perigynia sparsely setose-scabrous toward the apex, red-dotted; achenes narrowly oblong-obovoid; style usually abruptly bent; scales acuminate, usually long-aristate.81b. *C. spissa* var. *seatoniana*
1. Perigynia 7–8 mm. long, elliptic-lanceolate, tapering at the apex, slenderly many-nerved, largely concealed by the scales; achenes long-stipitate; style elongate, straight; lowest bract long-sheathing.82. *C. pringlei*

29. PSEUDOCYPEREAE

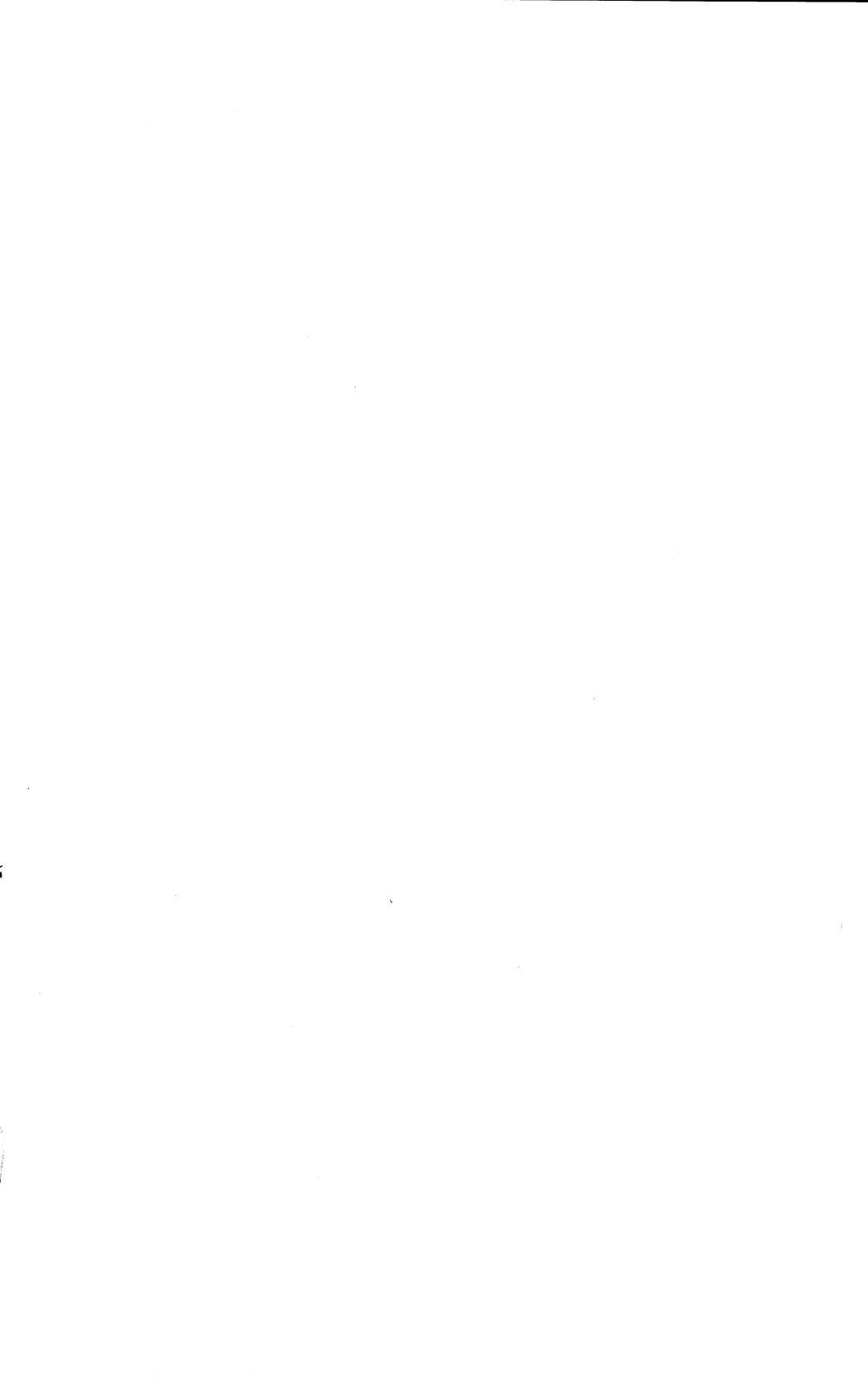
1. Perigynia suborbicular in cross-section, more or less inflated, membranaceous or submembranaceous; rootstocks with long, slender, horizontal stolons; leaves septate-nodulose.
2. Perigynia 5–7 mm. long, inflated, the beak about 2 mm. long; achenes obovoid; body of scale small.
.....83. *C. hystericina*
2. Perigynia 4–5 mm. long, slightly inflated, the beak 1.5 mm. long, their lateral ribs vanishing at the base of the beak; achenes oblong-obovoid; body of scale large.
.....84. *C. thurberi*
1. Perigynia (especially the beak) flattened-triangular, scarcely inflated, coriaceous, their lateral ribs prominently extending into the teeth of the beak; culms not stoloniferous; leaves very strongly septate-nodulose.
3. Teeth of perigynia recurved-spreading, 1.25–2 mm. long; body of beak 1.5–2 mm. long; perigynium-stipe strongly oblique.85. *C. comosa*
3. Teeth of perigynia erect, 1 mm. long; body of beak 1 mm. long; perigynium-stipe straight.86. *C. polysticha*

30. SQUARROSAE

One species.....87. *C. frankii*

31. VESICARIAE

One species.....88. *C. lurida*



SPECIES DESCRIPTIONS

1. § CAPITATAE

1. *Carex capitata* L. (3)

Carex capitata L., Syst. Nat. ed. 10. 1261. 1759.

Loosely to densely cespitose, with short-creeping, purplish-red rootstocks; *culms* 10–35 cm. high, slender, wiry, shorter than to much longer than, the leaves, purplish-red at the base, the old leaves persistent; *leaves* usually 2–4 to a culm, the blades involute, filiform, stiff, pale-green, the sheaths truncate at the mouth with a very short ligule; *spike* solitary, androgynous, globose or ovoid, 4–10 mm. long, 3–7 mm. wide, generally brownish-green; *bract* none; *pistillate scales* orbicular to broadly ovate, obtuse, dark-brown with broad hyaline margins and apex, shorter and narrower than the perigynia; *perigynia* spreading or ascending, plano-convex, ovate, 2.3–3.5 mm. long, 1.5 mm. wide, nerveless ventrally, finely few-nerved dorsally, sessile, the margin smoother with only very sparse hairs, abruptly contracted into a smooth, brownish short beak, less than 1 mm. long; *achenes* lenticular, 1.5×1 mm.; *stigmas* 2, slender; *rachilla* bristlelike, shorter than the achene.

Known in our area from only a single collection: marshes, Mound Valley, south of Pacheco, Chihuahua, C. V. Hartman 687, June 10, 1891 (F; GH; US). Alpine or subalpine; Greenland to Hudson Bay and Alaska, southward very locally to New Hampshire, Alberta, Wyoming, Nevada, California, and northern Mexico; also northern Eurasia.

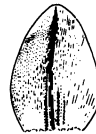
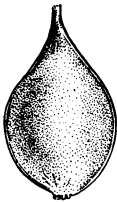
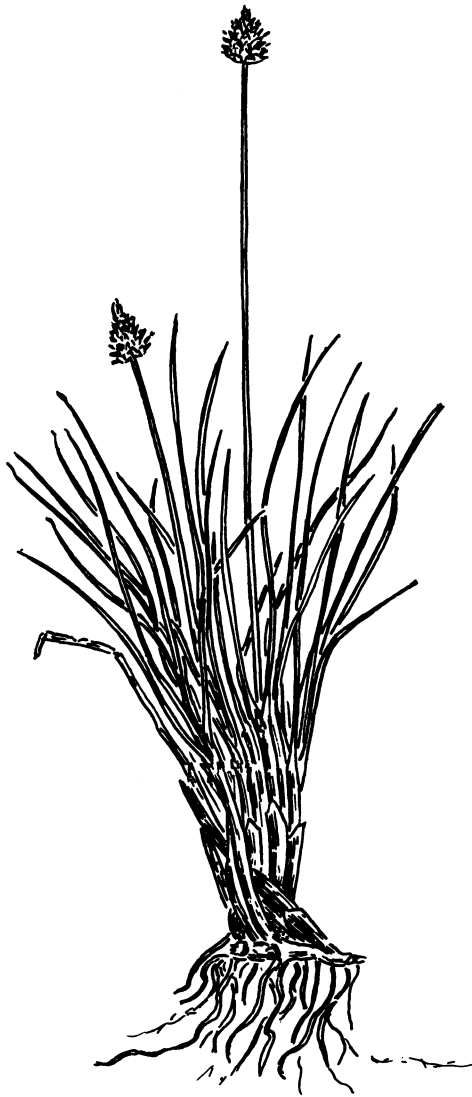


Plate 1. CAREX CAPITATA

2. § DIVISAE

2. *Carex praegracilis* W. Boott (19)

Carex praegracilis W. Boott, Bot. Gaz. 9: 87. 1884

C. marcida Boott, in Hook., Fl. Bor. Am. 2: 212. 1839, not J. F. Gmel. 1791.

Rootstocks thick, blackish, long-creeping; *culms* arising singly in small clumps, 20–75 cm. high, sharply triangular, usually roughened above and exceeding the leaves; *leaves* clustered near the base of the culms, flattened or somewhat channeled, 1.5–3 mm. wide, the sheaths truncate at the mouth, the ligule very short; *spikes* 5–15, densely aggregated into a linear-oblong or oblong-ovoid head 1–5 cm. long, 5–10 mm. thick, the lower spikes sometimes separate, androgynous (occasionally almost entirely staminate or pistillate), the staminate flowers inconspicuous; *scales* ovate, acuminate, or cuspidate, light chestnut with conspicuous hyaline margins and pale midrib, wider and longer than the perigynia; *perigynia* plano-convex, ovate to ovate-lanceolate, sharp-margined, 3–4 mm. long, about 1.5 mm. wide, brownish-black at maturity, coriaceous, dull, flat and nerveless ventrally, rounded and lightly several-nerved dorsally, short-stipitate, tapering into a serrulate beak half the length of the body or more, the orifice with overlapping hyaline edges; *achenes* lenticular, obovoid, about 1.25 mm. long; *stigmas* slender, reddish-brown.

A polymorphic species fairly common in moist, open habitats, chiefly on the plains but occasionally in open woods up to 9,000 ft. from Chihuahua southward to the Distrito Federal. Manitoba, Iowa, and Kansas westward to the Yukon, British Columbia, California, and Mexico, and adventive eastward.



Plate 2. CAREX PRAEGRACILIS

3. § POTOSINAE

3. *Carex potosina* Hemsl. (23)

Carex potosina Hemsl., Biol. Centr. Am. Bot. 3: 474. 1885.

C. schaffneri W. Boott in S. Wats., Proc. Am. Acad. 18: 172. 1883, not Böck. 1878.

Cespitose, but with long, slender, deep-seated, brown, scaly root-stocks; *culms* stiff, 1.5–3 dm. high, clothed at the base with old leaves; *leaves* with well-developed blades 4–10 to a culm, on the lower fourth, the blades 1–2 dm. long, 2–3 mm. wide, rather thick, flat, canaliculate, the margins roughened toward the apex, the sheaths tight, thin and hyaline ventrally, thickened and prolonged at the mouth, the ligule wider than long; *spikes* 2–5, androgynous, 7×5 mm., forming a head 1–3 cm. long, 7 mm. wide; *lower bracts* 3–12 cm. long, 1 mm. wide, enlarged at the base, the upper scale-like; *scales* acuminate to awned, yellowish-brown with green, three-nerved center and hyaline margins; *staminate flowers* inconspicuous; *perigynia* few, erect-ascending or spreading, plano-convex, ovate, 5 mm. long, 2.5 mm. wide, very thick, coriaceous, sulcate-nerved dorsally, strongly granular-tuberculate, serrulate to the middle, sharp-edged to the substipitate base, rather abruptly narrowed into a serrulate, bidentate and obliquely cut beak about 2 mm. long, dark-chocolate-brown with green upper margins; *achenes* lenticular, 2.5×2 mm., substipitate, jointed with the deciduous style which is enlarged at the base.

Frequent on dry plains and slopes up to 7,000 ft., Coahuila, Zacatecas, and San Luis Potosí.

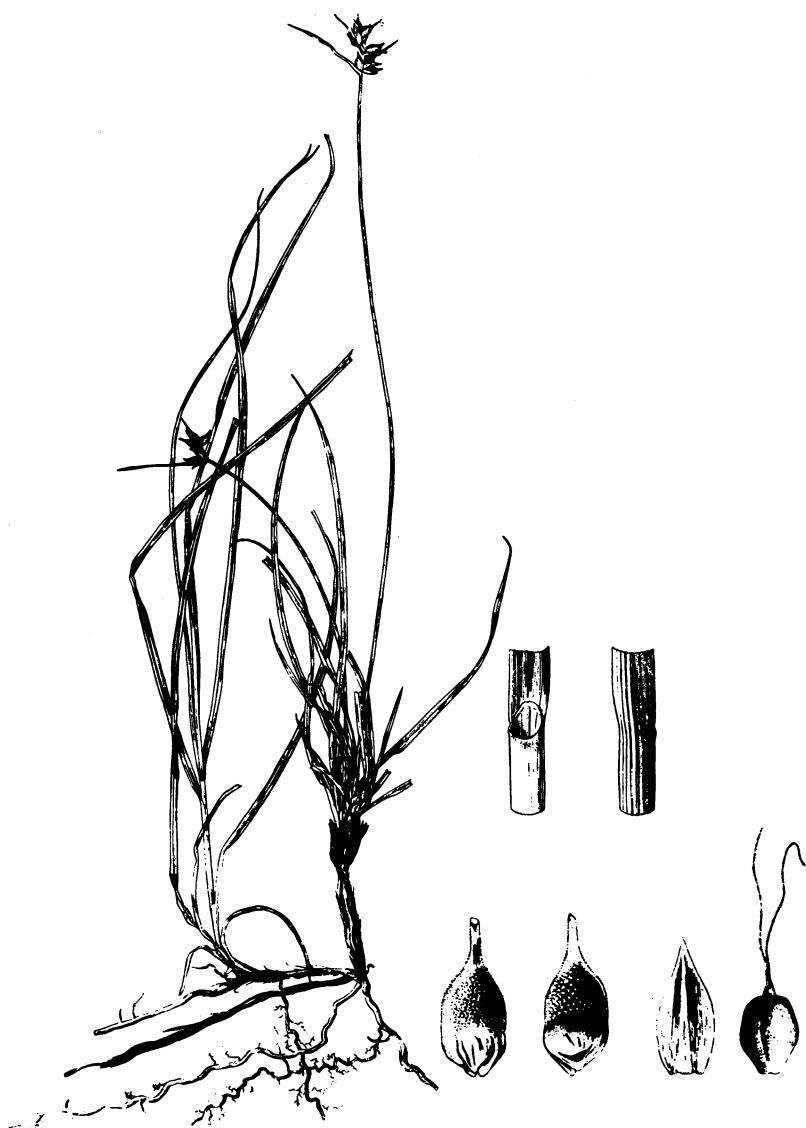


Plate 3. CAREX POTOSINA

4. § BRACTEOSAE

4. *Carex vallicola* Dewey (31)

Carex vallicola Dewey, Am. Jour. Sci. II. 32: 40. 1861.

Cespitose from short-prolonged, fibrillose rootstocks; *culms* slender, 2–6 dm. high, roughened on the angles below the head; *leaves* about 3 to a culm, 1–1.5 mm. wide, thin, the sheaths light, thin ventrally, the ligule very short, wider than long; *spikes* closely aggregated into a dense, terminal, oblong-linear head, 1.5–2.5 cm. long, 6–8 mm. wide, the staminate flowers terminal and inconspicuous; *scales* broadly triangular, shorter than the perigynia, hyaline with the centers brownish and one–three-nerved, acute to short-cuspidate; *perigynia* plano-convex, oblong-elliptic, 3.5–3.75 mm. long, 1.75–2.25 mm. wide, margined, greenish or brownish-tinged, nerveless ventrally, obscurely nerved dorsally, glossy at maturity, the margin more or less serrulate above, abruptly narrowed into a minutely serrulate beak about 1 mm. long, obliquely cut and only shallowly bidentulate; *achenes* lenticular, orbicular, substipitate, 2×2 mm.

Rare or infrequent in dry soil in the mountains up to 9,500 ft.; Hidalgo and the State of Mexico. South Dakota to Montana, Oregon, California and Mexico.

A characteristic of *C. vallicola* (and its var. *hidalgensis*) that distinguishes it readily from other sedges is the dorsal bulging of the mature perigynium. The distention is so pronounced that the resultant stretching of the perigynium walls displaces the thickened margins so that they run down the ventral surface of the perigynium.

4a. *Carex vallicola* var. *hidalgensis* F. J. Herm. (31a)

Carex vallicola var. *hidalgensis* F. J. Herm., Brittonia 12: 78. 1960.

Differs from typical *C. vallicola* in its markedly broader and prominently bidentate perigynium-beak which is not hyaline-tipped. Also the inflorescence tends to be broader and subcapitate rather than spiciform as in the typical form.

Rare or local on open mountain slopes; known only from two collections in the State of Hidalgo, Mexico (Buena Vista, C. G. Pringle 13,429 (GH; MICH), Aug. 6, 1904, and Pachuca, E. Hernandez X. 465 (in part) (MICH), Aug. 27, 1944).



**Plate 4a. CAREX VALLICOLA
VAR. HIDALGENSIS**

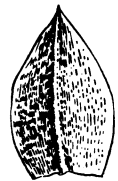
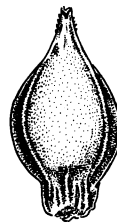


Plate 4. CAREX VALLICOLA

5. *Carex involucratella* Mack. (36)

Carex involucratella Mack., N. Amer. Fl. 18(1) : 50. 1931.

Rootstock short, stout, black, woody and fibrillose; *culms* 3–7 dm. high, phyllopodic, pale-brownish at the base, the old leaves conspicuous; *leaves* with well-developed blades 6–8 to a culm, on the lower fourth, the blades 1.5–3 dm. long, 3–5.5 mm. wide, rather thick, flat or channeled, roughened on the margins, the sheaths tight, concave and slightly thickened at the mouth, the ligule wider than long, usually colored on the margin; *spikes* 10–20, androgynous, forming a head 2–3 cm. long, 1.35–1.60 cm. wide; *lower bracts* elongate, the upper scale-like; *scales* acute or cuspidate, greenish or whitish with light-yellowish-brown hyaline margins, three-nerved; *staminate flowers* inconspicuous; *perigynia* 10–20 to a spike, appressed or ascending, plano-convex, 4.25 mm. long, 2.5–3 mm. wide, submembranaceous, stramineous, ribbed dorsally, sharp-margined, serrulate above, stipitate, the beak 1.5 mm. long, serrulate, dorsally cleft, bidentate, the teeth triangular-subulate, appressed, the sutures conspicuous; *achenes* lenticular, 2×1.75 mm., substipitate, apiculate, jointed with the short basally enlarged style.

Infrequent or rare on dryish hillsides and roadsides in central Mexico (San Luis Potosí, Queretaro, and Distrito Federal).



Plate 5. CAREX INVOLUCRATELLA

6. *Carex occidentalis* Bailey (38)

Carex occidentalis Bailey, Mem. Torrey Bot. Club 1: 14. 1889.

Rootstocks short-creeping, stout, black, fibrillose; *culms* slender, exceeding the leaves, sharply triangular, roughened above; *leaves* flat but the margins somewhat revolute, 1.5–2.5 mm. wide, the sheaths tight, the ligule variable, sometimes longer than wide but as often wider than long; *spikes* 4–10, the upper aggregated and indistinguishable in the lax, oblong to linear-oblong head, 1.5–3 cm. long, the lower somewhat separate, androgynous, the staminate flowers inconspicuous, the perigynia loosely ascending or somewhat spreading; *scales* ovate-triangular, about the length of the perigynia but somewhat wider and largely concealing them, acuminate or short-awned, brownish with opaque margins and green center; *perigynia* plano-convex, oblong-elliptic, 2.5–4.5 mm. long, 1.5–1.75 mm. wide, greenish straw-colored, in age brownish, the sharp margin narrow and green, sparingly serrulate above the middle, stipitate, abruptly narrowed into a serrulate, shallowly bidentate beak about one-third to one-half the length of the body; *achenes* lenticular, oblong-orbicular, 2×1.5 mm.

The occurrence of this species in Mexico is questionable since the record is based upon two very depauperate, atypical specimens (*E. Hernandez X. 486 & 487*) from a roadside bank (9,200 ft.), Real del Monte, near Pachuca, Hidalgo (Aug. 27, 1944), and a very immature collection (*D. E. Breedlove 19,216*) from a steep, moist slope, 3 mi. N. of Los Ornos along road to Ocurahui, Mun. de Badiraguato, 6,500 ft., Sinaloa.

Wyoming, Colorado, and Utah southward to New Mexico, Arizona, central Mexico (?), and California.



Plate 6. CAREX OCCIDENTALIS

7. *Carex xalapensis* Kunth (42)

Carex xalapensis Kunth, Enum. Pl. 2: 380. 1837.

Cespitose from short, stout, black, fibrillose rootstocks; *culms* 6–9 dm. high, 2.5–3 mm. thick at the dull-brown base, the old leaves conspicuous; *leaves* with well-developed blades about 5 to a culm, on the lower third, the blades 1–3.5 dm. long, 2.5–3.25 mm. wide, stiff, flat or channeled, roughened on the margins and toward the apex, the sheaths tight, concave and slightly thickened at the yellowish-brown-tinged mouth, the dark-margined ligule wider than long; *spikes* 6–12, androgynous, 5 mm. long, forming a head 15–35 mm. long, about 1 cm. wide; *lower 2–3 bracts* 2–4 cm. long, slightly enlarged at the base; *scales* acuminate or cuspidate, reddish-brown or yellowish-brown-tinged, the center green, three-nerved, the margins hyaline; *staminate flowers* inconspicuous; *perigynia* 10–20 to a spike, 3–3.5 mm. long, 2–2.25 mm. wide, ascending-spreading, plano-convex, membranaceous, light-green to yellowish-brown, few-nerved dorsally, sharply margined, serrulate above, corky-thickened below, substipitate, the beak 1 mm. long, dorsally cleft, bidentate, the teeth subulate-triangular, the sutures conspicuous; *achenes* lenticular, 1 mm. long, filling the perigynia, stipitate, apiculate, jointed with the style at its enlarged base.

Fairly common on open or wooded, usually dryish slopes; occasional in moist (especially pine) woods, up to 9,200 ft., from Chihuahua, south to Chiapas, and Guatemala.



Plate 7. CAREX XALAPENSIS

5. § MULTIFLORAE

8. *Carex agrostoides* Mack. (55)

Carex agrostoides Mack., Bull. Torrey Bot. Club 34: 607. 1908.

Densely caespitose from short, stout rootstocks; *culms* 4–8 dm. high, exceeding the leaves, roughened on the angles, the base clothed with dried leaves; *leaves* very long-attenuate, 1–5 mm. wide, stiff, flat below becoming involute and roughened above, the sheaths tight, conspicuously white-hyaline and somewhat red-dotted ventrally, the ligule wider than long; *spikes* very numerous, androgynous or staminate at the base and apex, aggregated into a decompound head 4–12 cm. long, 8–20 mm. thick, the lower usually more or less separate, the perigynia appressed; *scales* oblong-ovate or lanceolate, rather obtuse or acuminate or short-awned, greenish-straw-colored or pale brown, the three-nerved, green center becoming whitish in age, the margins conspicuously hyaline, wider but slightly shorter than the perigynia; *perigynia* plano-convex, lanceolate-cuneate, 2.5–3.5 mm. long, 0.9–1.5 mm. wide, light greenish, becoming straw-colored, narrowly sharp-margined to the round-tapering, short-stipitate base, serrulate above, nerveless ventrally, obscurely few-nerved dorsally, tapering above into a serrulate, bidentate, white-tipped beak as long as or longer than the body; *achenes* lenticular, narrowly oblong-ovoid, yellowish-brown, 1.5×0.5 mm., substipitate.

Occasional in arid habitats from Baja California and Chihuahua to Durango, Mexico. Southern Arizona and New Mexico to Mexico.



Plate 8. CAREX AGROSTOIDES

9. *Carex marianensis* Stacey (58)

Carex marianensis Stacey, Leaf. W. Bot. 2: 31. 1937.

C. autumnalis Mack., N. Amer. Fl. 18(2): 66. 1931, not Ohwi, 1930.

Rootstocks short, woody, blackish, fibrillose; *culms* 6–9 dm. high, 4–5.5 mm. thick at the light-brownish base, smooth, phyllopodic; *leaves* with well-developed blades 5–8 to a culm, on the lower fourth, the blades 1–2 dm. long, 3.5–6 mm. wide, flat, roughened on the slightly revolute margins toward the apex, the sheaths tight, septate-nodulose dorsally, usually red-dotted ventrally and high-convex near the mouth, the ligule very short; *spikes* 8–20, androgynous, forming a head 2–8 cm. long, 8–20 mm. wide; *lower bracts* setaceous, the upper scale-like; *scales* acute or cuspidate, light-brown with one- three-nerved center and hyaline margins; *staminate flowers* inconspicuous; *perigynia* 5–20 to a spike, plano-convex, 3.5–4 mm. long, 1.5–2 mm. wide, appressed or spreading, membranaceous, greenish-straw-colored, obscurely nerved, sharp-edged, serrulate above, spongy at the base, the beak 1.25 mm. long, serrulate, dorsally cleft, bidentate; *achenes* lenticular, 2×1.5 mm., yellowish, stipitate, apiculate, jointed with the style.

Fairly common in meadows, occasionally in forests, chiefly in the mountains up to 11,000 ft.; endemic to Mexico, from Chihuahua to Chiapas.



Plate 9. CAREX MARIANENSIS

10. *Carex percostata* F. J. Herm. (58.1)

Carex percostata F. J. Herm., Jour. Wash. Acad. Sci. 40 (9) : 282. 1950.

Rootstocks stout, woody, short-creeping, blackish, fibrillose; culms 3–6 dm. high, erect, about twice the length of the leaves, bluntly triangular and coarsely ribbed, smooth except below the head where scaberulous, phyllopodic; leaves 3–6 to a fertile culm, clustered near the base, the blades flat, stiff, dull-green, 1–3 dm. long, 3–4 mm. wide, the margins roughened toward the long-attenuate apex, the sheaths hyaline ventrally, scarcely prolonged at the mouth, the ligule short, usually broader than long; head broadly oblong to ovoid-oblong, 2–2.5 cm. long, 1–1.5 cm. wide, the spikes 7–12, androgynous, aggregated or the lower more or less separate, ovoid, with 5–8 ascending or at length spreading perigynia, the staminate portion prominent; bracts squamiform, the lower one or two generally abruptly setaceous-prolonged; scales ovate, acute or short-cuspidate, narrower than, and about the length of, the bodies of the perigynia, dirty-brown with very narrow hyaline margins and stramineous, one- three-nerved center; perigynia unequally biconvex, oblong-ovoid, 4–5 mm. long, 2.25–2.5 mm. wide, lustrous, tawny-stramineous, the upper half becoming brown, coriaceous, heavily 10–15-ribbed and furrowed on both faces, scarcely sharp-edged, serrulate on the upper third, abruptly tapering into a serrulate, bidentulate, dorsally cleft beak one-fourth the length of the body, the base very spongy and rounded or abruptly tapering to a short stipe; achenes lenticular, obovate, olive-brown, 2.5×2.2 mm., apiculate.

Infrequent in meadows and swales, up to 7,000 ft.; Chihuahua, Durango, and Guerrero.

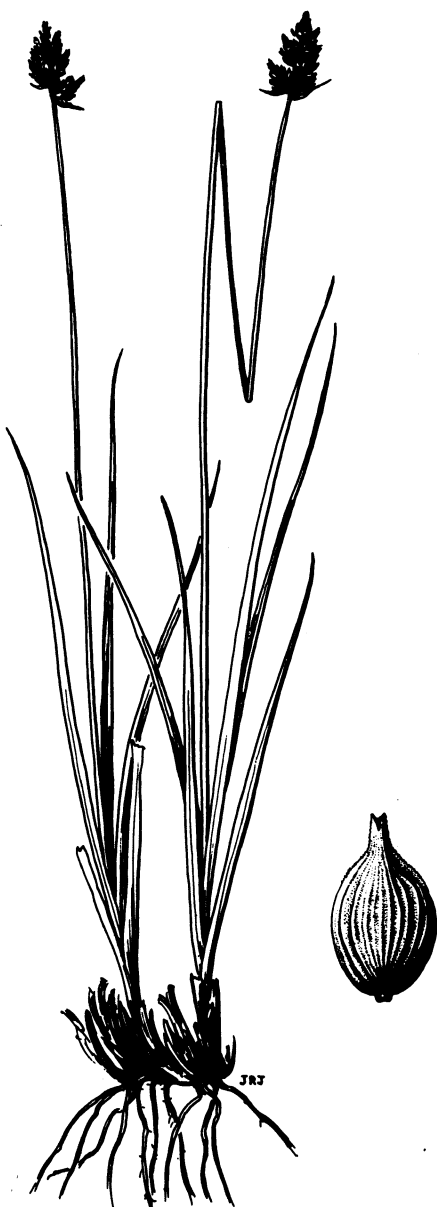


Plate 10. CAREX PERCOSTATA

6. § VULPINAE

11. *Carex chihuahuensis* Mack. (73)

Carex chihuahuensis Mack., Bull. Torrey Bot. Club 35: 265, 1908.

Loosely cespitose from long-creeping rootstocks; *culms* 2–4 dm. high, aphyllopodic, slender, exceeding the leaves; *leaves* clustered toward the base, flat or channeled, rather thick, 2–3 mm. wide, roughened toward the apex, the sheaths tight, somewhat red-dotted toward the mouth, the ligule very short, wider than long; *spikes* densely aggregated (or the lower separate) into a simple or somewhat compound, ovoid or oblong head, 2–7 cm. long, 7–15 mm. thick, the spikes scarcely distinguishable, the apical staminate flowers inconspicuous; *scales* oblong-ovate, obtuse, brown or light brownish with paler center and white-hyaline margins, as wide as but somewhat shorter than the perigynia; *perigynia* plano-convex, narrowly ovate, 3.5 mm. long, 1.5 mm. wide, straw-colored or yellowish-brown-tinged, sharp-margined, conspicuously several-nerved dorsally and less so ventrally, short-stipitate, serrulate above the middle, tapering into a serrulate, deeply bidentate beak one-fourth to one-third the length of the body; *achenes* lenticular, oval, 1.5×1 mm.

Local in the mountains of Chihuahua, in both moist and rocky habitats at 5,000 to 8,000 ft.; also in southeastern Arizona (Pinaleno Mountains, Graham County).



Plate 11. CAREX CHIHUAHUENSIS

7. § STELLULATAE

12. *Carex interior* Bailey (105)

Carex interior Bailey, Bull. Torrey Bot. Club 20: 426. 1893.

Densely cespitose from short, dark-colored rootstocks; *culms* erect or ascending, slender but firm, wiry and strict, sharply triangular, 1.5–5 dm. high, usually longer than the leaves; *leaves* about 3 to a culm, thin, flat or slightly channeled, 1–3 mm. wide, the sheaths tight, the ligule wider than long; *spikes* 2–4(–6), somewhat, but not closely, crowded into an oblong head, the terminal usually gynaeceandrous and long-clavate, but sometimes entirely staminate and narrowly linear or almost entirely pistillate and oblong, the 1–10 perigynia of the lateral spikes widely spreading at maturity; *scales* broadly ovate, very obtuse, yellowish-brown with broad white-hyaline margins and green center, half the length of the bodies of the perigynia; *perigynia* concavo-convex, oblong-ovoid to deltoid, 2.25–3.25 mm. long, 1.5–2 mm. wide, plump and firm, the body broadest just above the base, thick-margined, olive-green becoming brown, several-nerved dorsally, nerveless to definitely nerved ventrally, rather abruptly narrowed into a sparingly serrulate, shallowly bidentate beak about one-third or one-fourth the length of the body, the ventral false suture inconspicuous; *achenes* lenticular, broadly ovate-orbicular, 1.25×1.5 mm.

In our area known from a single collection from Mexico: Cañada de Contreras, vicinity of Dinamo Quarter, 9,800 ft., Distrito Federal. Labrador to British Columbia, southward to Pennsylvania, Kansas, northern California, and central Mexico.

12a. *Carex interior* f. *keweenawensis* (F. J. Herm.) Fern. (105a)

Carex interior f. *keweenawensis* (F. J. Herm.) Fern., Rhodora 44: 284. 1942.

C. interior var. *keweenawensis* F. J. Herm., Am. Midl. Nat. 25: 19. 1941.

Differing from typical *C. interior* in having the perigynia conspicuously nerved ventrally instead of nerveless or few-nerved only at the base.

Known in our area from two collections in Mexico: Colonia Garcia, and near Colonia Juarez, Sierra Madre, Chihuahua.



Plate 12. CAREX INTERIOR

13. *Carex townsendii* Mack. (115)

Carex townsendii Mack., N. Amer. Fl. 18 (2) : 111. 1931.

Cespitose from short, blackish, fibrillose rootstocks; *culms* 2–3.5 dm. high, smooth or roughened beneath the head, brownish and fibrillose at the base; *leaves* 5–6 to a culm, on the lower third, the blades 1–2 dm. long, 2–2.5 mm. wide, canaliculate, rather thick, stiff, light-green, roughened above, erect or recurved-spreading, the sheaths tight, hyaline and yellowish-green-tinged ventrally, convex and slightly thickened at the mouth, the ligule wider than long; *spikes* 5–8, pistillate or the uppermost gynaeceandrous, 5–8 mm. long, 5–6 mm. wide, forming a head 2–4 cm. long; *lower bract* setaceous, the others scale-like; *scales* rather obtuse, chestnut-brown with three-nerved, green center and hyaline margins; *staminate* flowers few; *perigynia* 8–20 to a spike, 3–3.5 mm. long, 1.5–1.75 mm. wide, spreading, plano-convex, rather thick, membranaceous, lightly nerved dorsally, sharp-edged, serrulate toward the beak, spongy at the base, the beak 1 mm. long, serrulate, obliquely cut dorsally, bidentate; *achenes* lenticular, 1.75×1.5 mm., yellowish-brown, stipitate, apiculate, jointed with the deciduous style.

Occasional in bogs and on banks of streams in the mountains, up to 11,000 ft., from Chihuahua to Guatemala.



Plate 13. CAREX TOWNSENDII

14. *Carex angustior* Mack. (117)

Carex angustior Mack. in Rydb., Fl. Rocky Mts. 124. 1917.

Densely caespitose from very short rootstocks; *culms* very slender but strict, 1–6 dm. high, sharp-angled and roughened above, about equaling the leaves; *leaves* 2–4 to a culm, 0.75–2 mm. wide, flat or channeled, the sheaths tight, more or less red-dotted ventrally, the ligule as wide as long; *spikes* 2–5, approximate or little separate, the terminal gynaeceandrous, the lateral pistillate, 5–15-flowered, forming a head 1–2(3) cm. long, the perigynia widely spreading at maturity; *scales* ovate, shorter than the perigynia, yellowish with green midrib; *perigynia* plano-convex, lanceolate to lanceolate-ovate, 2.5–3.5 mm. long. 1–1.4 mm. wide, nerveless ventrally and obscurely nerved dorsally, yellowish-brown, sharp-edged with slightly raised smooth margins, tapering into a sparingly serrulate, deeply bidentate beak more than half the length of the body; *achenes* lenticular, ovate, 1.75×1 mm., yellowish.

Infrequent, usually in wet soil at high elevations; Distrito Federal (Desierto de los Leones), Mexico and Departments of Huehuetenango and Totonicapan, Guatemala. Newfoundland to Maryland and in the mountains to North Carolina, westward to Washington, California, Mexico, and Guatemala.

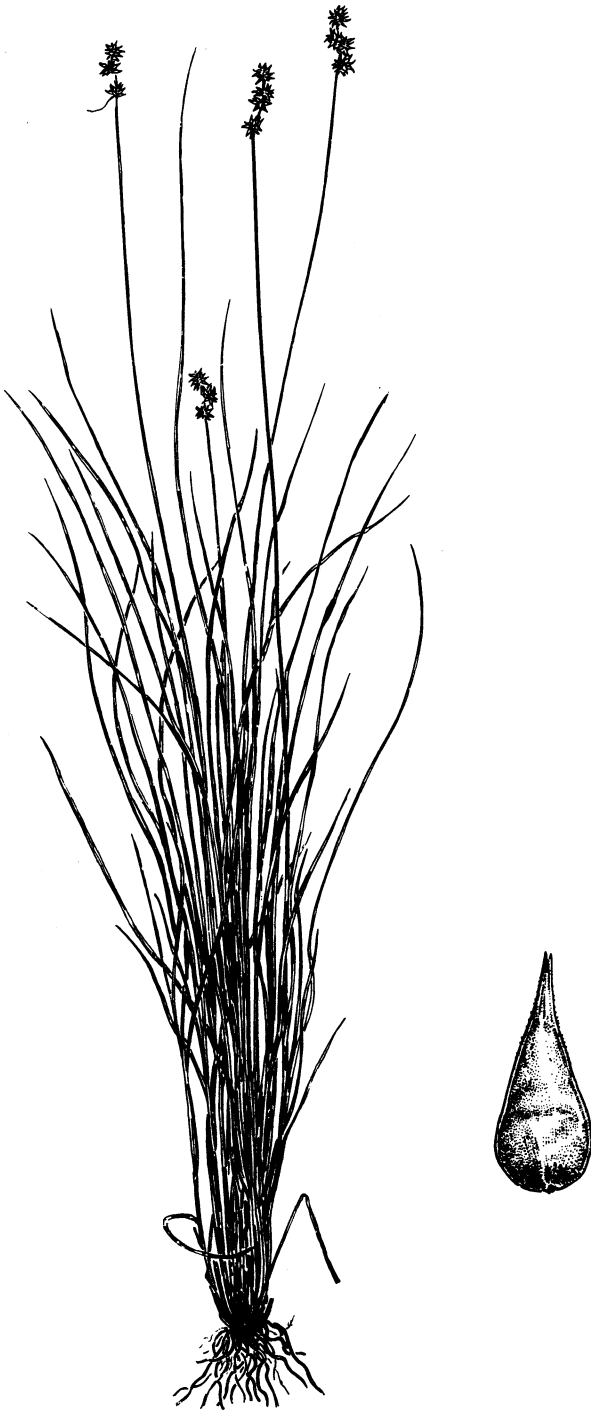


Plate 14. CAREX ANGUSTIOR

8. § DEWEYANAE

15. *Carex bromoides* Schkuhr (120)

Carex bromoides Schkuhr in Willd., Sp. Pl. 4: 258. 1805.

Densely cespitose from long, blackish, fibrillose rootstocks; *culms* 2.5–8 dm. high, slender, rough on the angles above, brownish and clothed with old leaves at the base; *leaves* with well-developed blades 2–5 to a fertile culm, on the lower fourth, the blades 3–7 cm. (up to 7 dm. on the sterile culms) long, 1–2.5 mm. wide, flat, roughened on the margins and toward the apex, the sheaths tight, thin and hyaline ventrally, concave and slightly thickened and prolonged at the mouth; *spikes* 2–7, gynaeceandrous, androgynous, pistillate or staminate, the lower 5–20 mm. long, 3–4 mm. wide, forming a head 2–6 cm. long; *lower bracts* prolonged, the upper scale-like; *scales* thin, rather obtuse to acuminate, straw-colored or brownish with three-nerved, green center and white-hyaline margins; *perigynia* 6–15 to a spike, 4.5–5 mm. long, 1–1.3 mm. wide, erect-appressed, plano-convex, thin, membranaceous, pale-green, few-nerved, sharp-margined to the middle, serrulate above, the lower third corky, substipitate, the beak 1.5–2 mm. long, serrulate, bidentate, the dorsal suture reddish-brown margined; *achenes* lenticular, 2×0.75 mm., tightly enveloped, yellowish-brown, stipitate, apiculate, jointed with the deciduous style.

Known in our area from a single collection: banks of brooks, Trinidad 5,800 ft., Hidalgo, Mexico (*C. G. Pringle* 8809, Apr. 30, 1904). Nova Scotia and Quebec to Wisconsin, southward to Florida, Louisiana, and Hidalgo.

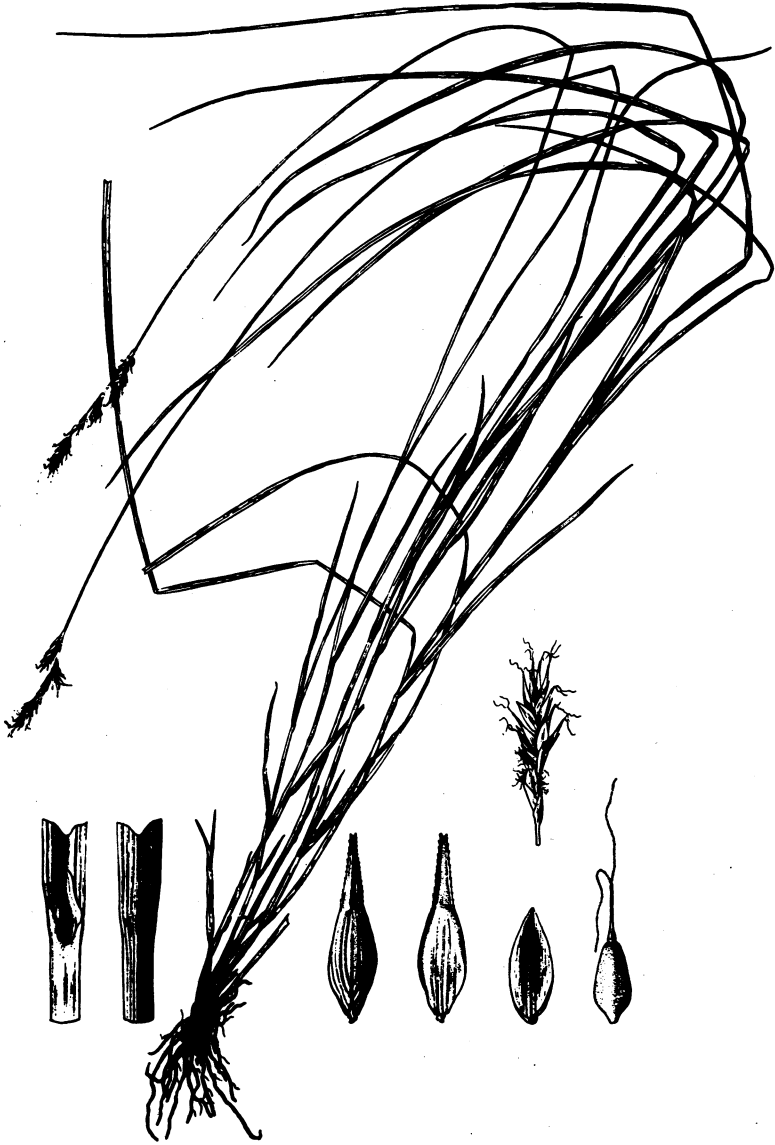


Plate 15. CAREX BROMOIDES

9. § OVALES

Subsection I. *Festivae*

16. *Carex volcanica* F. J. Herm. (126.1)

Carex volcanica F. J. Herm., Brittonia 23 (2) : 144. 1971.

Cespitose, but having stout, short-creeping rootstocks; *culms* 12–70 cm. high, strict, obtusely triquetrous, striate, 2–3.5 mm. thick at the base, exceeding the leaves, aphyllopodic; *leaves* with well-developed blades 3–6 to a culm, aggregated toward the base, the blades flat, 8–20 cm. long, 2–4 mm. wide, roughened toward the acuminate apex, the sheaths tight, white-hyaline ventrally, the ligule wider than long; *spikes* 4–12, gynaeandrous, oblong-ovoid, 6–9 mm. long, 3–6 mm. wide, sessile, with numerous, appressed perigynia forming a head 1–2 cm. long, 7–15 mm. wide; *bracts* shorter than the inflorescence; *scales* ovate-lanceolate, short-acuminate, brown with more or less hyaline margins, not concealing the perigynia; *perigynia* thin-plano-convex, narrowly lanceolate, 3–4.75 mm. long, 1.1–1.5 mm. wide, chartaceous, brown or blackish-brown, three- seven-nerved on both faces, very narrowly winged, contracted to the sessile, spongy base, narrowed above into a narrow, serrulate beak 1–1.5 mm. long, terete at the dark-brown apex; *achenes* lenticular, oblong-ovoid, 1.5 × 1 mm., sessile; *anthers* short-persistent, apiculate, 1.3–1.75 mm. long.

Frequent to fairly common on slopes of volcanic mountains, from 10,000 to 13,000 ft., in Mexico (Michoacan, Mexico, Distrito Federal, Puebla, and Veracruz), and from the Department of Huehuetenango (11,000 ft.), Guatemala.



Plate 16. CAREX VOLCANICA

17. *Carex bonplandii* Kunth (134)

Carex bonplandii Kunth, Enum. Pl. 2: 380. 1837.

Rootstocks long-creeping, slender; *culms* arising one to several together, sharply triangular, 0.5–6 dm. high, exceeding the leaves; *leaves* 2–8 to a culm, clustered at the base, rather thick, flat or channeled, 1–3.5 mm. wide; *spikes* 3–12, distinct but more or less aggregated into a head 1–3 cm. long, 0.5–2 cm. thick, the individual spikes with 5–20 closely appressed perigynia with erect-appressed beaks; *lower bract* brownish with hyaline margins, dilated at the base, cuspidate, short (0.5–1 cm.) to long and equaling or even exceeding the head; *scales* ovate, light- to dark-chestnut-brown with lighter midrib and narrow, hyaline margins, as wide as, but shorter than, the perigynia; *perigynia* plano-convex, or sometimes concave ventrally, thick, coriaceous, narrowly ovate or lanceolate, 3–4 mm. long, 1–1.25 mm. wide, light-green becoming brownish, very narrowly margined almost to the base, serrulate above the middle, lightly several-nerved dorsally, few-nerved toward the base ventrally, tapering into a serrulate, at length bidentulate, beak half the length of the body or more, the tip terete, smooth, chestnut-brown, hyaline at the orifice, the dorsal suture conspicuous to the top of the achene; *achenes* lenticular, oblong-ovoid, $1.5\text{--}1.75 \times 0.75\text{--}1$ mm., short-stipitate, yellowish-brown; *anthers* deciduous, apiculate, 1.5 mm. long.

Montane meadows and creek banks; Oaxaca (Sierra de San Filipe, 10,000 ft.), Guatemala (Department of Huehuetenango); fairly common in Costa Rica. Arizona (Gila County) to southern Mexico, Guatemala, Costa Rica, and Peru.

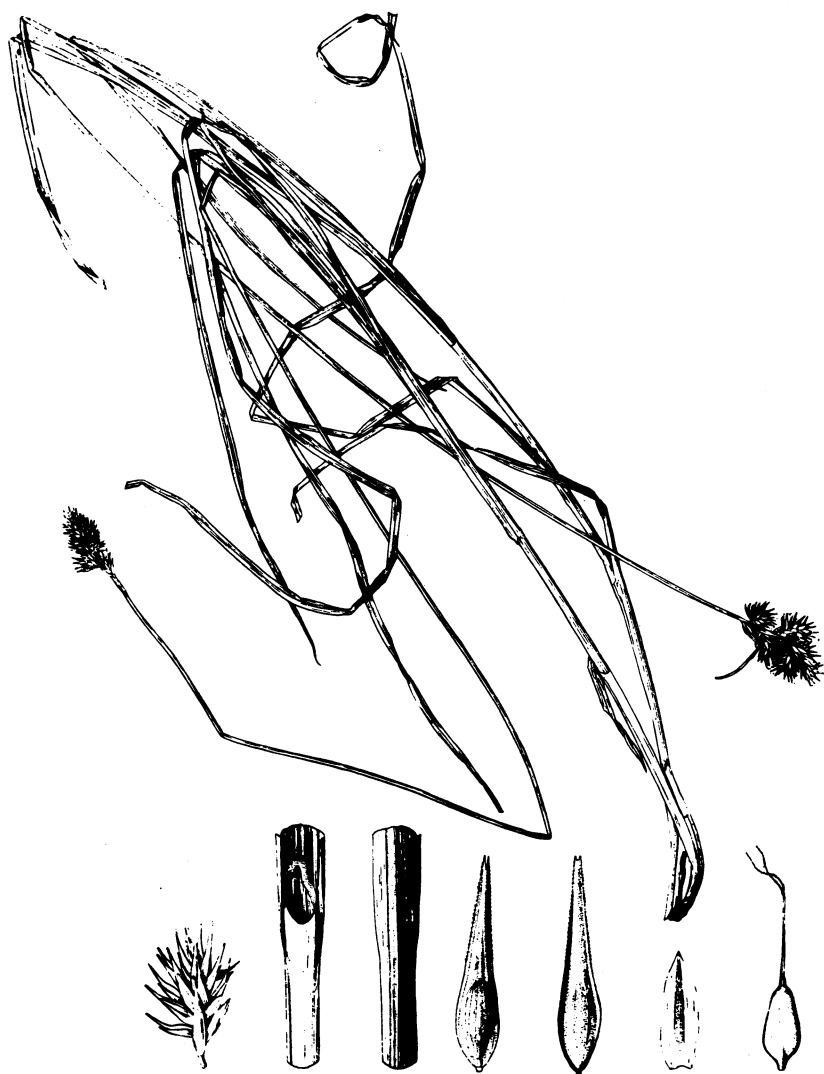


Plate 17. CAREX BONPLANDII

18. *Carex purdiei* Boott (135)

Carex purdiei Boott, Ill. *Carex* 26, Pl. 67. 1858.

Cespitose from creeping, stout, woody, blackish, fibrillose root-stocks; *culms* 2.3–8 dm. high, stiff, roughened beneath the head, aphyllopodic, clothed with the old leaves at the light-brownish base; *leaves* with well-developed blades 3–5 to a fertile culm, on the lower third, their blades 1–2 dm. long, 1.5–3.5 mm. wide, rather stiff, flat or canaliculate, the sheaths tight, thin and white-hyaline ventrally, prolonged at the mouth, truncate; *sterile shoots* conspicuous; *spikes* 6–12, gynaeandrous or pistillate, 5–7 mm. long, 4–5 mm. wide, forming a head 2–4.5 cm. long; *lower bracts* setaceous; *scales* acutish, thin, light-chestnut-brown-tinged with a green, three-nerved center and hyaline margins; *perigynia* 6–20 to a spike, appressed-ascending, ovate, 3.5 mm. long, 1.5 mm. wide, plano-convex, rather thick, subcoriaceous, greenish or yellowish-green, finely nerved dorsally, sharp-edged, serrulate above the middle, spongy at the stipitate base, the serrulate beak much shorter (1 mm. long) than the body, obliquely cut dorsally, bidentate, reddish-brown-tinged, the dorsal suture conspicuous; *achenes* lenticular, 1.7×1 mm., yellowish or in age dark-colored, stipitate, apiculate, jointed with the deciduous style.

Fairly common in wet habitats in the mountains of Costa Rica at 6,000 to 10,000 ft. A collection from Iztaccíhuatl, State of Mexico, may be this species but it is too immature for certainty. Also in Colombia.



Plate 18. CAREX PURDIEI

19. *Carex subbracteata* Mack. var. *tolucensis* F. J. Herm. (143a)

Carex subbracteata Mack. var. *tolucensis* F. J. Herm., Brittonia
23 (2) : 145. 1971.

Cespitose from short, blackish, fibrillose rootstocks; *culms* 3–10 dm. high, stiff, obtusely triangular, smooth, light-brownish at the base; *leaves* with well-developed blades, 3–5 to a fertile culm, on the lower third, the blades 0.8–2.5 dm. long, 2.25–3.75 mm. wide, flat, stiff, the sheaths tight, hyaline ventrally, thin and prolonged at the mouth; *spikes* 4–10, gynaeandrous, 6–10 mm. long, 4–6 mm. wide, forming a head 14–22 mm. long; *lower bracts* dilated at the base, brown with hyaline margins; *scales* more or less obtuse, reddish-brown with pale center and white-hyaline margins; *staminate flowers* few; *perigynia* 10–20 to a spike, 4.25–4.5 mm. long, 2.25 mm. wide, appressed-ascending, plano-convex, thick, coriaceous, dull-greenish to yellowish-brown, nerveless, serrulate above, spongy at the substipitate base, abruptly narrowed into an incurved, serrulate, bidentulate beak about 1 mm. long, hyaline at the apex; *achenes* lenticular, 2×1.5 mm., thick, substipitate, apiculate, jointed with the deciduous style.

Known from a single collection; steep hillside (west-facing slope covered with *Pinus-Abies* woods and tussock grasses), 9,186 ft., 17 mi. S.W. of Toluca on road to Temaxcaltepec, State of Mexico, July 9, 1964, G. Mick & K. Roe 236 (MICH). Typical *C. subbractea* is found in the Coast Ranges of California.



Plate 19. CAREX SUBBRACTEATA VAR. TOLUCENSIS

Subsection II. *Festuceae*

20. *Carex diehlii* M. E. Jones ex F. J. Herm. (166.1)

Carex diehlii M. E. Jones ex F. J. Herm., Amer. Midl. Nat. 51 (1) : 268. 1954.

Cespitose from stout, brown rootstocks; *culms* 3.4–5 dm. high, stiff, almost twice the length of the leaves, coarsely striate, obtusely triangular and smooth below, somewhat acutely angled and more or less scabridulous below the heads; *leaves* with well-developed blades 3–5 to a fertile culm, chiefly on the lower third, the blades conspicuously canaliculate, erect, 4–15 cm. long, 1.5–4 mm. wide, the long-attenuate, scabridulous apex more or less trigonous, the sheaths tight, ventrally white-hyaline, thin, generally ruptured and sometimes brown-stained in age, concave at the mouth, becoming strongly fibrillose with age, the ligule slightly wider than long; *spikes* 5–7, gynaeandrous, sessile, aggregated into an ovoid to broadly oblong head 15–20 mm. long, 10–14 mm. wide, the perigynia 9–20, ascending to erect-appressed; *bracts* prolonged-squamiform, long attenuate, the lowermost sometimes almost leaf-like and somewhat exceeding to twice the length of the head; *scales* oblong-lanceolate, acute to acuminate, chestnut-brown, narrowly hyaline-margined, prominently one-nerved, carinate and hyaline along the midrib, 4 mm. long, not concealing the perigynia; *perigynia* plano-convex, narrowly ovate-lanceolate, 4 mm. long, 1.6–1.9 mm. wide, coriaceous, stramineous, nerveless ventrally or faintly five- seven-nerved toward the base, dorsally five- nine-nerved or ribbed, very slightly distended over the achene, narrowly wing-margined, narrowed to the rounded, sessile or minutely substipitate spongy base, the body serrulate on the margins above, tapering into a dark, flat, shallowly bidentate beak 1–1.5 mm. long; *achenes* lenticular, oblong, 1.7×1 mm., glossy, gray flecked with dark-red.

Known only from two collections, both from Chihuahua: meadow valley, 7,000 ft., Sierra Madre Mountains, *M. E. Jones*, Sept. 17, 1903, and Majalca, *Harde Le Sueur 1130*, June 24, 1936.



Plate 20. CAREX DIEHLII

21. *Carex brevoir* (Dewey) Mack. (167)

C. brevior (Dewey) Mack. in Lunell, Am. Midl. Nat. 4: 235. 1915.
C. straminea var. *brevior* Dewey, Am. Jour. Sci. 11: 158. 1826.

Cespitose from short-prolonged, woody rootstocks; *culms* 3–10 dm. high, sharply triangular, exceeding the leaves; *leaves* 3–6 to a culm, on the lower one-third, 1.5–4 mm. wide, the sheaths tight, conspicuously white-hyaline ventrally; *spikes* 3–10, gyn-aecandrous, usually more or less clavate at the base, generally separated in a moniliform inflorescence but occasionally aggregated into a short head, the 8–20 perigynia with spreading-ascending beaks; *scales* ovate, acuminate, yellowish-brown with green center and narrow hyaline margins, reaching to the middle or tip of the perigynium-beak; *perigynia* plano-convex or slightly concavo-convex, broadly ovate to suborbicular, 3.5–5.5 mm. long, 2.5–3.5 mm. wide, usually broadest near the middle, firm, coriaceous, green to greenish-white, strongly wing-margined to the rounded or subtruncate base, finely serrulate to below the middle, strongly several- to many-nerved dorsally, nerveless or faintly few-nerved ventrally, more or less abruptly narrowed into a flat, finely serrulate, strongly bidentate beak less than one-third the length of the body; *achenes* lenticular, orbicular, 1.75–2 × 1.5–1.75 mm., yellowish-brown, substipitate.

In our area known from a single collection: La Vengoma, 3,200 ft., vicinity of San José, Sierra de San Carlos, Tamaulipas, *H. H. Bartlett* 10088, July 5, 1930. It is a species of plains and both dry and moist openings in the mountains. Quebec to British Columbia, southward to Tennessee, Texas, Arizona, northern Mexico, Idaho, and Oregon.



Plate 21. CAREX BREVIOR

22. *Carex peucophila* Holm (168)

Carex peucophila Holm, Contr. U. S. Natl. Herb. 8: 290. 1905.

C. oreades C. A. Mey., in Galeotti, Bull. Acad. Brux. 9(2): 248, name only, 1842.

C. pinetorum Liebm., Danske Vid. Selsk. Skr. V. 2: 263. 1850, not Willd. 1836.

C. straminea var. *australis* Bailey, Mem. Torrey Bot. Club 1: 23. 1889.

C. lagunensis M. E. Jones, Contr. W. Bot. 18:26. 1933-35.

Rootstocks long, slender, brownish, fibrillose; *culms* 5-40 cm. long, 1.5-3 mm. wide at the dull-brownish base, erect or arcuate, obtusely triangular, roughened below the head; *leaves* with well-developed blades 2-4 to a fertile culm, on the lower fourth, their blades 3-15 cm. long, 1.25-2.5 mm. wide, flat or channeled, thin, firm, dull-green, obscurely septate-nodulose, the margins revolute, roughened towards the attenuate apex, the sheaths rounded dorsally, tight and white-hyaline ventrally, truncate at the mouth, the ligule wider than long; *spikes* 3-6, gynaeandrous, 5.5-9 mm. long, 4.5-6 mm. wide, aggregated into a head 1-2 cm. long, 7-15 mm. wide; *lowest bract* often prolonged, the upper reduced; *scales* obtuse, rounded on the back, chestnut-brown with three-nerved green center and white-hyaline apex and upper margins; *staminate flowers* few; *perigynia* 7-22 to a spike, 4-4.5 mm. long, 1.75-2.25 mm. wide, appressed-ascending, plano-convex, thickish, firm, subcoriaceous, dull-green or brownish, nerveless ventrally and nearly so to finely nerved dorsally, wing-margined, serrulate above, substipitate, the beak about 1 mm. long, serrulate and flat nearly to the apex (but sometimes terete for up to 0.5 mm. below the white-hyaline orifice), obliquely cut, entire or bidentulate, dull-reddish-brown-tipped; *achenes* lenticular, 2×1.5 mm., yellowish, substipitate, subapiculate, jointed with the style.

A polymorphic species very common in the mountains, at 8,000 to 15,000 ft., from Baja California and Durango to Guatemala (Sierra de los Cuchumatanes), especially on the volcanic peaks in the State of Mexico and Hidalgo.



Plate 22. CAREX PEUCOPHILA

23. *Carex egglestonii* Mack. var. *festivelliformis* F. J. Herm. (171a)

Carex egglestonii Mack. var. *festivelliformis* F. J. Herm., Brittonia 12(1) : 78. 1960.

Cespitose from short, woody, blackish, fibrillose rootstocks; *culms* 2–5 dm. high, roughened on the angles below the head, light-brown at the base, clothed with old leaves; *leaves* with well-developed blades 3–6 to a fertile culm, on the lower third, their blades 0.8–2 dm. long, 2–4 mm. wide, flat, thickish, the sheaths white-hyaline ventrally, the ligule about as long as wide; *spikes* 2–6, gynaeceandrous, 8–10 × 4–7 mm., aggregated in a ovoid or oblong-ovoid head or a short moniliform spike 12–20 mm. long; *lowest bract* 10–40 mm. long, the upper scale-like; *scales* acutish to acuminate, chestnut-brown with lighter midvein and the margins sometimes hyaline; *staminate flowers* few; *perigynia* numerous, 4.75–6 (rarely 7.5) mm. long, 1.5–2.25 mm. wide, exceeding the scales, appressed-ascending, flattened concavo-convex, thin, membranaceous, brownish, nerveless, serrulate, the winged margins sometimes slightly crenulate, the beak 1.5–2 mm. long, flat, serrulate, obliquely cut dorsally, bidentate, the orifice brown, sometimes hyaline-margined; *achenes* lenticular, 2–2.25 × 1.25 mm., substipitate, apiculate, jointed with the deciduous style.

Occasional to locally rather common in mountain meadows and open pine forests, at 9,000 to 12,000 ft., from Chihuahua to the Distrito Federal, Mexico.



Plate 23. CAREX EGGLESTONII VAR. FESTIVELLIFORMIS

Subsection III. *Alatae*

24. *Carex longii* Mack. (182)

Carex longii Mack., Bull. Torrey Bot. Club 49: 372. 1922.

Densely cespitose from short, blackish, fibrillose rootstocks; *culms* 3–8 dm. high, roughened on the angles below the head, light-brownish-tinged and clothed with old leaves at the base; *leaves* with well-developed blades 2–4 to a fertile culm, on the lower half, their blades 1–2.5 dm. long, 1.75–4 mm. wide, flat, rather thick, roughened on the margins and toward the apex, the sheaths tight, green-striate ventrally nearly to the mouth, prolonged at the mouth and continuous with the ligule; *spikes* 3–10, gynaeceandrous, 6–12 mm. long, 4–6 mm. wide, silvery-green or brownish, aggregated in a head 2–4 cm. \times 5–12 mm.; *bracts* short, setaceous; *scales* obtuse to somewhat acute, silvery-hyaline with green, three-nerved center; *perigynia* numerous, 3–4.5 mm. long, 1.8–2.2 mm. wide, appressed-ascending, flat-plano-convex, broadly obovate, the body widest near the top, membranaceous, distended over the achene, silvery- or light-brownish-green, slenderly nerved on both faces, wing-margined nearly to the base, serrulate, the beak 0.5 mm. long, flat, serrulate, obliquely cut dorsally, bidentulate; *achenes* lenticular, 1.5 \times 0.75 mm., yellowish-brown, substipitate, apiculate, jointed with the deciduous style.

Fairly common in moist to wet habitats in the mountains from 4,000 to 9,500 ft., from San Luis Potosí to Costa Rica. Massachusetts to Florida and Costa Rica, westward to Michigan, Indiana, Texas and Mexico.

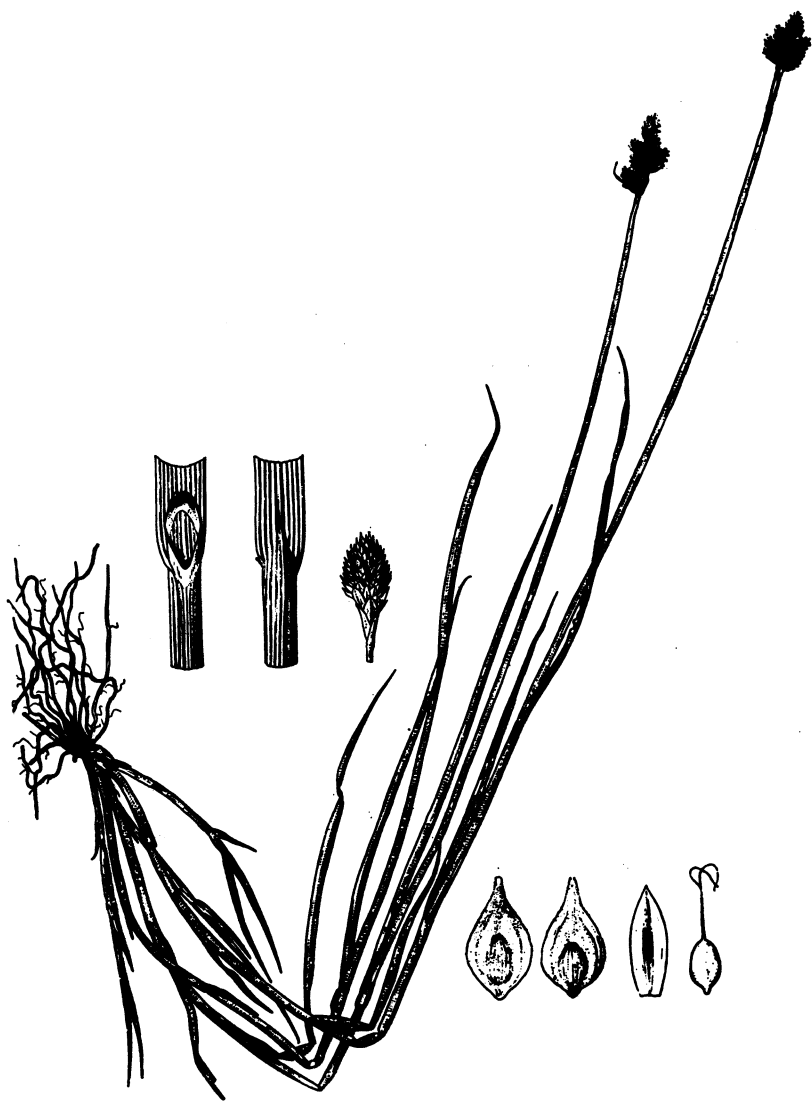


Plate 24. CAREX LONGII

Subsection IV. *Tribuloideae*

25. *Carex tribuloides* Wahl. (186)

Carex tribuloides Wahl., Sv. Vet.-Akad. Nya Handl. 24:145. 1803.

Cespitose from short, blackish fibrillose rootstocks; *culms* 6–9 dm. high, the sides concave, roughened on the angles below the head, clothed at the base with old leaves; *leaves* with well-developed blades 4–10 to a fertile culm, on the lower half, their blades 1.5–4 dm. long, 2.25–7 mm. wide, flat, stiff, roughened especially on the revolute margins and toward the apex, the sheaths loose, green-striate ventrally, slightly thickened, concave, white-hyaline and often dark-banded at the mouth, short-prolonged, the ligule longer than wide; *spikes* 5–15, gynaeandrous, 6–12 × 4–8 mm., straw-colored or greenish, in a head 2.5–5 cm. long, 0.8–2 cm. wide; *lowest bract* often setaceous, the upper scale-like; *scales* acute or acuminate, light-yellowish-brown with white-hyaline margins and green, three-nerved center; *staminate flowers* inconspicuous; *perigynia* numerous, lanceolate, 3–5 mm. long, 1–1.5 mm. wide, erect-ascending, flat-plano-convex, membranaceous, distended over the achene, greenish or straw-colored, nerved on both faces, strongly margined with pellucid wings, serrulate above, short-stipitate, the beak 1–1.2 mm. long, flat, serrulate, obliquely cut dorsally, bidentate, the orifice white-hyaline margined; *achenes* lenticular, 1.5 × 0.5–0.75 mm., stipitate, apiculate, jointed with the deciduous style.

Known in our area from a single collection: near Jalapa, 4,000 ft., Vera Cruz, Mexico, *C. G. Pringle* 7802, Apr. 27, 1899 (GH; USA). A species of swamps and wet meadows, ranging from Quebec to Minnesota, southward to Florida, Louisiana, and Mexico.

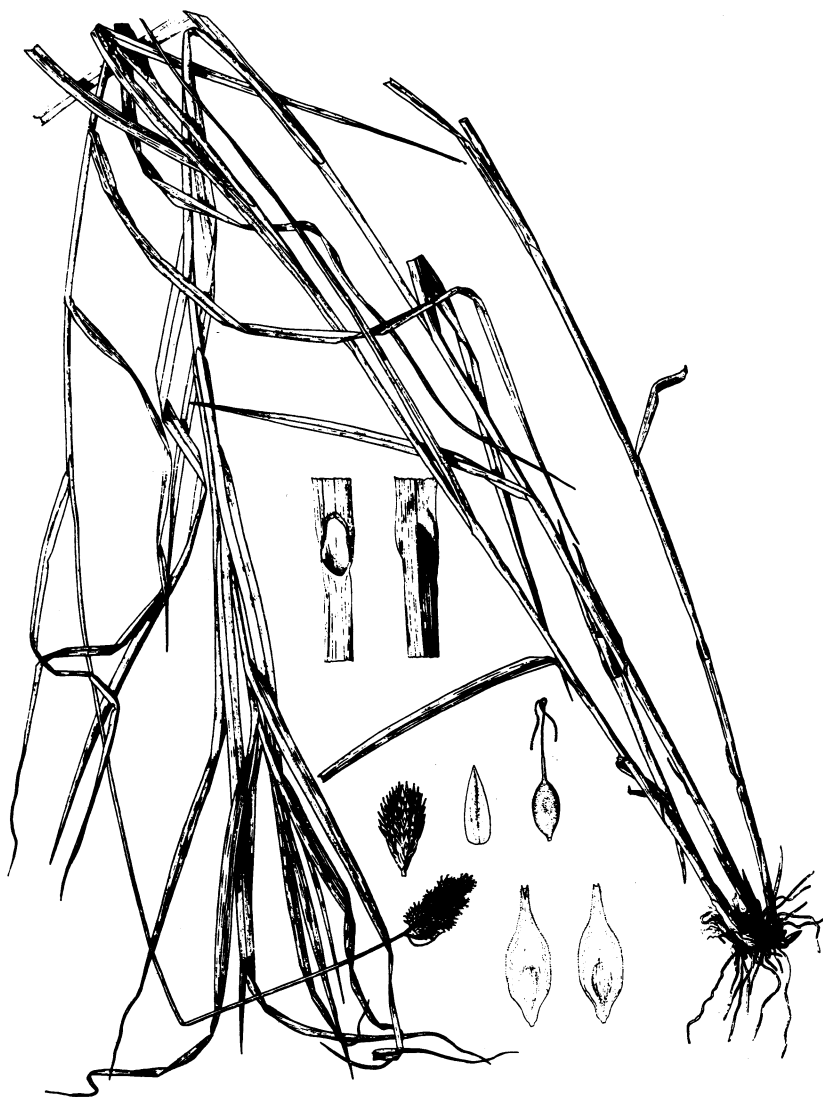


Plate 25. CAREX TRIBULOIDES

Subsection V. *Foeneae*

26. *Carex xerantica* Bailey (191)

Carex xerantica Bailey, Bot. Gaz. 17: 151. 1892.

Cespitose from short-creeping, fibrillose rootstocks; culms 3–6 dm. high, stiff, erect, much exceeding the leaves; leaves 2 or 3 to a culm, flat, rather stiff, 2–3 mm. wide; spikes 3–6, gynaeceandrous, approximate but distinct, forming a usually elongate inflorescence 2–5 cm. long, the perigynia closely appressed; scales ovate, thin, light reddish-brown with green center and white-hyaline margins, about the size of the perigynia and nearly concealing them until overripe; perigynia flat, except where distended by the achene, ovate, 4–6 mm. long, 2–2.5 mm. wide, usually broadest below the middle, greenish, straw-colored or pale-brown, broadly winged to the base, serrulate to below the middle, lightly nerved dorsally, nerveless or nearly so ventrally, tapering into a broad, flat, serrulate, bidentate beak 1–1.3 mm. long, reddish-brown at the tip; achenes lenticular, quadrate-suborbicular, 2.5×1.5 –1.75 mm.; anthers early deciduous.

Known in our area from two collections from Durango, Mexico: open grassland in pine-oak woodland, gentle west-facing slope of broad arroyo, tributary to Rio Presidio, 7,800 to 8,200 ft., ca. 5 mi. north of railroad at Coyotes, J. H. Maysilles 8283, Aug. 8, 1955 (MICH), and, open pine-oak woods $5\frac{1}{2}$ mi. east of El Salto, ca. 55 mi. southwest of Durango, U. L. Waterfall & C. S. Wallis 13592, Aug. 12, 1957 (US). Manitoba to Alberta, southward to central Mexico.



Plate 26. CAREX XERANTICA

Subsection VI. *Athrostachyae*

27. *Carex athrostachya* Olney (195)

Carex athrostachya Olney, Proc. Am. Acad. 7: 393. 1868.

Cespitose from very short-prolonged, fibrillose rootstocks; *culms* 0.5–6 dm. high, slender, more or less equaling the leaves; *leaves* 2–4 to a culm, usually clustered on the lower third, the blades flat, 1.5–5 mm. wide, firm, yellowish-green; *spikes* 4–20, gynaeandrous, aggregated into a head 1–2 cm. long, 7–20 mm. wide, or the lowest somewhat separate, the perigynia appressed-ascending; *bracts* usually strongly developed (at least one to three of the lower), 1–6 cm. long, and exceeding the head, spreading or ascending, the upper bracts scalelike; *scales* oblong-ovate, acute or short-cuspidate, brownish to reddish-brown with green center and white-hyaline margins, somewhat shorter than the perigynia; *perigynia* lanceolate-ovate, 3–5 mm. long, 1.25–1.75 mm. wide, flat except where distended by the achene, membranaceous, lightly several-nerved on both faces or nerveless ventrally, light-green to straw-colored or brownish, wing-margined nearly to the base, the upper half strongly ciliate-serrulate, tapering into a shallowly bidentate beak, its tip little flattened or serrulate; *achenes* lenticular, oblong-oval, $1.25\text{--}1.5 \times 0.75\text{--}1$ mm.

Known in our area from a single collection: on stream banks in narrow, semi-moist gorge, 11,000 ft., Paraje Province, Popocatepetl, State of Mexico, *E. K. Balls* 4204, April 13, 1948 (US). Alaska southward to North Dakota, California, Arizona, and Mexico.



Plate 27. CAREX ATHROSTACHYA

10. § FILIFOLIAE

28. *Carex arsenii* Kükenth. (203)

Carex arsenii Kükenth., Repert. Sp. Nov. 8 : 326. 1910.

Densely caespitose from short, black, fibrillose rootstocks; *culms* 2.5–6 dm. high, rough below the head, yellowish-brown-tinged at the base; *leaves* 2–4 to a fertile culm, bunched at the base of the culms, their blades 1–2.5 dm. long, 1.5–2 mm. wide, flat or canaliculate, rather thick, attenuate, the sheaths tight, hyaline ventrally, yellowish-brown-tinged, short-prolonged and truncate at the mouth, the ligule short, dark-margined; *spike* solitary, androgynous, 2.5–4 cm. long, 2.5–3.5 mm. wide, bractless; *scales* obtuse, the lowest awned, light-reddish-brown with lighter midvein and white-hyaline margins; *perigynia* 15–30, concealed by the scales, 2.5–3 mm. long, 1 mm. wide, appressed, flattened-trigonus, membranaceous, slightly inflated, green, yellowish-brown-tinged, sparsely short-hispid, especially on the angles above, two-keeled, the beak 0.5 mm. long, hyaline; *achenes* lenticular or trigonus, 2×0.75 mm., brown or dull-green, apiculate, jointed with the short, deciduous style.

Occasional in Michoacan at 5,000 to 6,000 ft.; also known from Jalisco and the State of Mexico.



Plate 28. CAREX ARSENI

29. *Carex longissima* M. E. Jones (203.1)

Carex longissima M. E. Jones, Contr. W. Bot. 18: 26. 1933.

Densely caespitose; *culms* 2–5 dm. high, very slender; *leaves* 2–5 to a fertile culm, about equaling the culms and aggregated at their base, the blades filiform, mostly 0.5 mm. wide, canaliculate or flat, attenuate; *spike* solitary, densely flowered, androgynous, the lower third pistillate, 4.5–6 cm. long, 2 mm. wide, usually flexuous, bractless; *scales* obtuse, about 4 mm. long, chestnut-brown, the pistillate aristate, concealing the perigynia; *perigynia* numerous, oblong, 3 mm. long, 1–1.25 mm. wide, closely appressed, flattened-trigonal, membranaceous, nerveless, sparsely short-hispid above, pale-yellowish-brown, sessile, abruptly contracted into a tubular, short-hispid beak 1 mm. long, obliquely cut at the apex; *achenes* trigonal, 2×0.75 mm., straw-colored, subsessile, apiculate.

Known only from the type collection: in clefts or rocks along trail, about the lower edge of the Middle Temperate life zone, Laguna Mountains, Baja California, *M. E. Jones 27594*, Sept. 22, 1930 (POM).



Plate 29. CAREX LONGISSIMA

30. *Carex oreocharis* Holm (204)

Carex oreocharis Holm, Amer. Jour. Sci. IV. 9: 358. 1900.

Densely cespitose from short, stout rootstocks; *culms* stiff, rather stout and slenderly sulcate, 1–3.5 dm. high, exceeding the leaves; *leaves* 2 or 3 to a culm, clustered near the base, thickish, 1.5–2 mm. wide, flattened-canaliculate toward the base, deeply channeled toward the attenuate apex, the sheaths very thin, the ligule wider than long; *spike* solitary, androgynous, 2–4 cm. long, the staminate part very conspicuous, 1–2 cm. long, many-flowered, the staminate scales oblong-lanceolate, obtuse, pale straw-colored, the pistillate part 4–6.5 mm. wide with 3–10 erect-appressed perigynia, the pistillate scales broadly orbicular, wider than and partly enveloping the much longer perigynia, the lower often empty, the lowermost usually conspicuously awned and bractlike; *perigynia* oblong-obovoid, 4–4.5 mm. long, 2 mm. wide, yellowish-green, substipitate, obscurely two-ribbed, otherwise nerveless, short-pubescent above, contracted into a cylindric, hyaline-tipped beak about 1 mm. long; *achenes* trigonous, 3×1.75 mm., yellowish.

Known in our area from a single collection: on rolling hills covered with agave, yucca and low mesquite, 7 mi. N.E. of Jimulco, Coahuila, Mexico, *Stanford, Retherford & Northcraft 35*, June 28, 1941 (GH). Wyoming, Colorado, Arizona, and northern Mexico.



Plate 30. CAREX OREOCHARIS

11. § MONTANAE

31. *Carex physorhyncha* Liebm. (215)

Carex physorhyncha Liebm. in Steud., Syn. Cyp. 219. 1855.

C. rhynchophysa Liebm., Danske Vid. Selsk. Skr. V. 2: 64. 1850,
not C. A. Meyer, 1844.

Loosely cespitose and stoloniferous; *stolons* slender, brownish, scaly, up to 8 cm. long; *culms* 25–35 cm. high, slender, roughened above, phyllopodic, reddish and fibrillose at the base, clothed with old leaves; *sterile shoots* aphyllopodic; *leaves* with well-developed blades 4–8 to a fertile culm, on the lower fourth, the blades 1–2 dm. long, 1.75–2.75 mm. wide, the upper reduced, flat or canaliculate, roughened toward the attenuate apex and on the revolute margins, the sheaths concave at the mouth; *terminal spike* staminate, 5–8 × 2 mm.; *lateral spikes* 3–4, pistillate, 4–7 mm. long, 3–5 mm. wide, with 6–12 appressed-erect perigynia; *lowest bracts* scale-like, sheathless, the upper reduced; *scales* nearly equaling the perigynia, acute or the pistillate cuspidate, with three-nerved, green center and hyaline margins; *perigynia* obtusely trigonous, 2.5–3 mm. long, 0.8–1 mm. wide, membranaceous, puberulent, two-ridged, spongy at the stipitate base, the beak 0.75 mm. long, bidentate, hyaline, whitish-tipped; *achenes* trigonous with convex sides, 1.5 × 1 mm., minutely pitted, truncate and minutely apiculate at the apex, jointed with the deciduous style.

Known in Mexico from two Hidalgo collections: wet woodlands near Trinidad Iron Works, 5,700 ft., *C. G. Pringle* 8965, Apr. 30, 1904 (ENCB; F; GH; US) and, open pine woods near Tejocotal, 6,600 ft., between Acarochitlan and Puebla border on Huauchinango road, *H. E. Moore* 2836, May 13, 1947 (GH). Southern Virginia to Arkansas, Oklahoma, and Hidalgo.



Plate 31. CAREX PHYSORHYNCHA

32. *Carex turbinata* Liebm. (218)

Carex turbinata Liebm., Danske Vid. Selsk. Skr. V. 2: 265. 1850.

Loosely cespitose from short, rather thick, woody root-stocks, sending forth ascending or rather short-creeping horizontal stolons; *culms* slender, 2.5–5 dm. high, phyllopodic, rough above, fibrillose at the brownish-tinged base; *leaves* with well-developed blades 5–8 to a fertile culm, clustered near the base, their blades 1–3 dm. long, 2–3.5 mm. wide, canaliculate, firm, thickish, with revolute margins, the sheaths whitish ventrally, ligule wider than long; *terminal spike* staminate, 1–2 cm. long, 2.25–2.5 mm. wide; *lateral spikes* 2–3, pistillate, with 5–15 perigynia, 5–12 mm. long, 4–6 mm. wide; *lowest bract* sheathless, 1–2 mm. wide, slightly colored at the base, the upper reduced; *scales* obtuse to cuspidate, reddish-brown with green, three-nerved center and hyaline margins; *perigynia* suborbicular, 3.5 mm. long, 1.5–1.75 mm. wide, ascending, membranaceous, puberulent, two-keeled and many-nerved, spongy at the stipitate base, the beak broad-conic, 0.5 mm. long, two-edged, hyaline or colored at the apex; *achenes* trigonous with convex sides and prominent blunt angles, 1.75×1.6 mm., dull-yellowish-brown, puncticulate, sub-stipitate, truncate and bent-apiculate, jointed with the short style.

Occasional in Chihuahua and Durango to fairly common in central Mexico, in the mountains at 2,000 to 10,000 ft.



Plate 32. CAREX TURBINATA

33. *Carex leucodonta* Holm (219)

Carex leucodonta Holm, Am. Jour. Sci. IV. 16: 461. 1903.

C. ringens Bailey, Bot. Gaz. 9: 117. 1884, not *C. ringens* Thuill. 1799.

Loosely cespitose from coarse, woody rootstocks; *culms* slender, 2–4 dm. high, clothed at the base with the dried leaves of the preceeding year, much exceeding the leaves; *leaves* 5–8 to a culm, clustered near the base, 2–3.5 mm. wide, rather thick and firm, dull-green, channeled above, the margins revolute, the sheaths whitish ventrally, the ligule much wider than long; *staminate spike* solitary, linear, short-peduncled, 1–3 cm. long; *pistillate spikes* 2 or 3, the upper approximate, the lower more or less strongly separate, sessile, or very short-peduncled, orbicular to short-oblong, 5–10 mm. long, 4–6 mm. wide, with 4–10 perigynia; *lowest bracts* leaflike, from slightly exceeding to shorter than the culms; *upper bracts* reduced; *scales* ovate-lanceolate, acuminate or short-awned, sharply keeled, narrower but somewhat longer than the perigynia, whitish-hyaline with green center; *perigynia* obovoid, 3.5 mm. long, 2 mm. wide, nearly globose, dull green to straw-colored, very short-pubescent, two-keeled and many-ribbed, stipitate, abruptly contracted into a short, erect, cylindric, very shallowly bidentate beak 0.5 mm. long; *achenes* suborbicular, trigonous, with prominent blunt angles, 2×1.8 mm.

Frequent on mountain slopes at 5,000 to 8,000 ft., usually in open pine-oak forests, from Sonora and Chihuahua, southward to Nuevo Leon and Jalisco. Southern Arizona and northern Mexico.

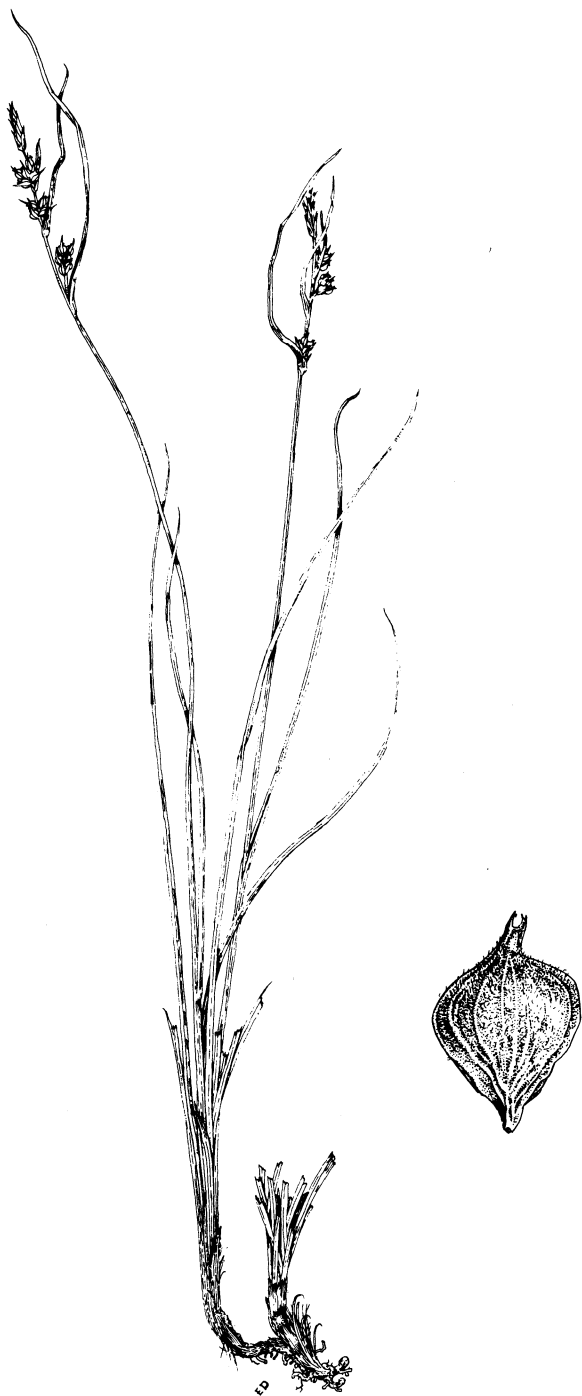


Plate 33. CAREX LEUCODONTA

34. *Carex geophila* Mack. (231)

Carex geophila Mack., Bull. Torrey Bot. Club 40: 546. 1913.

Densely cespitose from much branched rootstocks; *culms* 3–10 cm. high, conspicuously fibrillose at the base, slender but stiff, very rough on the angles, much shorter than, and mostly hidden among the bases of, the leaves; *leaves* 5–10 to a culm, channeled above, much roughened, 1.5–2.5 mm. wide, the sheaths little, if at all, filamentose ventrally, the ligule somewhat wider than long; *terminal spike* staminate, slender 5–15 mm. long, 1.5–2 mm. wide, rather strongly peduncled; *pistillate spikes* 2–5, mostly 5–15-flowered, the upper one or two usually approximate, the others widely separate and basal; *bract* of upper spike (sometimes lacking) scalelike, somewhat sheathing, shorter than the inflorescence; *scales* ovate, acute to cuspidate, reddish-brown (except those of the basal spikes) with green center and hyaline margins, about the size of the perigynia but not concealing them; *perigynia* suborbicular, 3.25–4 mm. long, 1.75 mm. wide, two-keeled, otherwise nerveless or nerved at the base, conspicuously stipitate (the stipe 0.5–0.75 mm. long), abruptly contracted into a conic, serrulate, bidentate beak 0.5–0.75 mm. long; *achenes* trigonous with convex sides and prominent angles, stipitate, 2.25×1.75 mm.

Occasional on dry slopes, at 10,000 to 13,000 ft.; State of Mexico, Puebla, Veracruz, Mexico, and Sierra de los Cuchumatanes, Guatemala. Colorado to New Mexico, Arizona, central Mexico, and Guatemala.



Plate 34. CAREX GEOPHILA

12. § TRIQUETRAE

35. *Carex triquetra* Boott (252)

Carex triquetra Boott, Trans. Linn. Soc. 20: 126. 1846.

Cespitose; *culms* 3–6 dm. high, stiff, smooth or roughened above, phyllopodic, cinnamon-brown-tinged at the base; *leaves* with well-developed blades 3–6 to a fertile culm, on the lower half, their blades 1–2 dm. long, 2.5–6 mm. wide, rigid, flat with revolute margins, vesicular-roughened, the sheaths tight, cinnamon-brown-tinged and red-dotted ventrally, concave at the mouth, the ligule wider than long; *terminal spike* staminate, 1–3 cm. long, 2–4 mm. wide; *lateral spikes* usually 3 with 5–30 perigynia, pistillate or androgynous, the lower remote, peduncled, 1–4.5 cm. long, 4–7 mm. wide; *bracts* short, the lower long-sheathing; *scales* obtuse to acute, or the pistillate cuspidate, copper-red with green or greenish three-ribbed center and hyaline margins; *perigynia* sharply trigonous, 4–4.5 mm. long, 2.5–2.8 mm. wide, ascending, membranaceous, grayish-green, pubescent, obscurely nerved, the beak minute, 0.3 mm. long, bidentate; *achenes* trigonous with concave sides, 3.5 × 2.5 mm., closely enveloped, puncticulate, jointed with the short, thickish style.

Known in Mexico from a single collection: near Encenda, Baja California, *M. E. Jones* 3744, Apr. 10, 1882 (MICH; US). Southern California and northern Baja California.



Plate 35. CAREX TRIQUETRA

36. *Carex planostachys* Kunze (253)

Carex planostachys Kunze, Suppl. Riedgr. 138, Pl. 35. 1844.

Cespitose from short, stout, branching rootstocks; *culms* from very short to 2 dm. high, phyllopodic, rough on the angles, brownish at the base; *leaves* clustered above the base, their blades from very short to 3 dm. long, 1–2.5 mm. wide, flat above, channeled at the base, stiff, rough, papillate, attenuate, the sheaths tight, truncate, becoming filamentose, the ligule very short; *terminal spike* staminate, sessile or short peduncled, 8–12 mm. long, 1.5–3 mm. wide; *lateral spikes* pistillate, 1–2 contiguous with the staminate spike and with several basal ones on slender scabrous peduncles, the non-basal spikes erect, contiguous or somewhat separated, sessile or peduncled, short-oblong, or linear-oblong, 5–10 mm. long, 3–4 mm. wide, with 6–12 perigynia; *lowest bract* of upper spikes setaceous, attenuate, strongly sheathing, the upper reduced; *scales* obtusish or acute or the pistillate cuspidate, greenish-white with several-nerved center; *perigynia* trigonous, 3.5 mm. long, 1.75 mm. wide, ascending, membranaceous, hispidulous, finely ribbed, substipitate at the spongy base, the beak very short (0.5 mm.), straight or bent, with obliquely cut orifice; *achenes* sharply trigonous with concave sides, closely enveloped, substipitate, minutely apiculate, jointed with the short, thickish style.

Fairly common (sometimes locally abundant) in dry, rocky soil, at 3,000 to 8,000 ft., chiefly in eastern Mexico from Chihuahua to Guatemala. Texas to Guatemala.



Plate 36. CAREX PLANOSTACHYS

13. § SCHIEDEANAE

37. *Carex schiedeana* Kunze (261)

Carex schiedeana Kunze, Suppl. Riedgr. 119, Pl. 30. 1842.

Cespitose from thick, matted rootstocks; *culms* 1.4–5 dm. high, phyllopodic, roughened above, brownish-black and fibrillose at the base, the old leaves conspicuous; *leaves* with well-developed blades 6–10 to a fertile culm, clustered near the base, the blades 1–2 dm. long, 1.5–3 mm. wide, flat or channeled at the base, little if at all revolute, stiff, thick, papillate above, light-green, the sheaths tight, the ligule short; *spikes* 4–7, androgynous, 5–10 mm. long, 4–6 mm. wide, with 5–10 perigynia, in a head 1.25–3 cm. long; *cladoprophyllum* conspicuous, perigynium-like; *bracts* leaf-like, much exceeding the inflorescence, sheathless; *scales* obtuse to cuspidate, white with three-nerved, green center and white-hyaline margins, often brownish-tinged; *perigynia* ovoid, trigonous, 3–3.5 mm. long, 1.75 mm. wide, appressed-ascending, membranaceous, green, white-hispid-hirsute, many-ribbed (the lateral ribs most prominent), substipitate, the beak 0.5 mm. long, obliquely cut and bidentate, the orifice white; *achenes* trigonous with concave sides, 2.5×1.5 mm., granular, closely enveloped, apiculate, jointed with the short style which is thickened at the base.

Locally plentiful on open or chaparral-covered slopes, 2,000 to 10,000 ft., in Coahuila and San Luis Potosí; occasional in Nuevo Leon, Tamaulipas, Jalisco, and Puebla.



Plate 37. CAREX SCHIEDEANA

37a. *Carex schiedeana* var. *perstricta* (Mack.) F. J. Herm., comb. nov. (260)

Carex perstricta Mack., Bull. Torrey Bot. Club 36: 479. 1909.

Differing from the typical variety in having the leaves seldom over 1.5 mm. wide, vesicular-roughened above rather than papillate, glaucous-green, their margins revolute, narrower spikes (2.5–3.5 mm. wide), and oblong-obovoid perigynia only 1–1.25 mm. wide, and usually not over 2.5 mm. long, tending to be white-scabrous rather than hispid. Intermediates occur with such frequency, however, that varietal status seems to be more realistic than specific.

Locally plentiful on nearly barren slopes and limestone ridges, 5,000 to 8,000 ft., in San Luis Potosí; infrequent in Coahuila, Tamaulipas, Jalisco, and Hidalgo.



Plate 37a. CAREX SCHIEDEANA VAR. PERSTRICTA

37b. *Carex schiedeana* var. *stellata* (Mack.). F. J. Herm., comb. nov. (262)

Carex stellata Mack., N. Amer. Fl. 18(4) : 226. 1935.

Differing from typical *C. schiedeana* in having the leaves only 3–6 to a fertile culm, their margins usually revolute, and the perigynia white-stellate as well as short-hispid, the beak merely emarginate, as a rule, rather than bidentate. Mackenzie reports the culms to be stellate-puberulent, a condition that must be infrequent. As with var. *perstricta*, transitional forms are sufficiently common to make specific status impractical.

Appears to be most prevalent in Hidalgo (on mountain slopes at 3,000 to 8,000 ft.), as var. *perstricta* is in San Luis Potosí and var. *schiedeana* in Coahuila. It has been collected also in Coahuila, Nuevo Leon, San Luis Potosí, Jalisco, Puebla, and Oaxaca.



Plate 37b. CAREX SCHIEDEANA VAR. STELLATA

14. § SCABRELLAE

38. *Carex scabrella* Wahl. (263)

Carex scabrella Wahl., Sv. Vet-Aka. Nya Handl. 24: 149. 1803.

Cespitose from short, stout rootstocks; *culms* phyllopodic, mostly filiform, becoming decumbent, brown and fibrillose at the base; *leaves* with well-developed blades 5–10 to a fertile culm, clustered near the base, their blades 20–35 mm. long, 0.5–1.5 mm. wide, flat with revolute margins, often channeled above, thin, roughened toward the long-attenuate apex, the sheaths tight, the ligule very short; *spikes* 3–4 to a panicle, androgynous, with 3–6 perigynia; *panicles* about 5, spike-like, 6–12 mm. long, 5–7 mm. wide, the upper sessile, the middle ones on slender, roughish peduncles, the lowest on long basal peduncles; *rachis* hispid; *cladoprophyllum* perigynium-like; *bracts* leaf-like, exceeding the inflorescence, from little to strongly sheathing; *scales* acutish to awned, scabrous, reddish-brown with several-nerved, lighter center and hyaline margins; *staminate flowers* inconspicuous; *perigynia* ovoid, trigonous, 3–4 mm. long, 1.5 mm. wide, ascending, subcoriaceous, punctulate, straw-colored, hispid, conspicuously many-ribbed, the beak 1 mm. long, curved or straight, bidentate; *achenes* trigonous with concave sides and blunt angles, closely enveloped, granular, straight- or bent-apiculate, jointed with the short style.

A single collection seen from our area: steep, heavily wooded slope, El Sumidero, 4,500 ft., 14 mi. north of Ixtla Gutiérrez, Chiapas, Mexico, *D. E. Breedlove* 13396, Oct. 16, 1965 (MICH). Reported from Guatemala. West Indies, Mexico, and Guatemala.



Plate 38. CAREX SCABRELLA

15. § INDICAE

39. *Carex humboldtiana* Steud. (264)

Carex humboldtiana Steud., Syn. Cyp. 208. 1855.

C. macrosperma Mack., Bull. Torrey Bot. Club 36: 477. 1909.

Cespitose from short, thick, woody rootstocks; *culms* phyllopodic, 6–10 dm. high, obtusely trigonous, brownish-tinged at the fibrillose base; *leaves* with well-developed blades 7–15 to a fertile culm, their blades 1–4 dm. long, 2.5–6 mm. wide, stiff, coriaceous, flat with revolute margins, scabrous above, attenuate, the sheaths tight, concave, reddish-brown-tinged, pubescent and slightly prolonged at the mouth, the ligule short; *spikes* 8–15 to a panicle, androgynous, with 2–5 perigynia, 5–10 mm. long; *panicles* 6–10, 2.5–5 cm. long, 1.5–2 cm. wide, the lower solitary on a slender, scabrous peduncle, the upper in pairs, the rachis hispid; *bracts* awned, 2–5 mm. long; *cladoprophyllum* conspicuous, perigynium-like; *scales* awned to obtuse, chestnut- or reddish-brown with lighter center and hyaline margins, striate, the midvein prominent, the lower empty; *perigynia* narrowly obovoid, trigonous, 4–5 mm. long, 1.25–1.5 mm. wide, ascending, membranaceous, bright-green, brownish-tinged, lustrous, punctulate, conspicuously two-nerved, spongy at the stipitate base, the beak 1–1.5 mm. long, obliquely cut and bidentate, roughened, often bent, the orifice hyaline; *achenes* trigonous with concave sides and blunt angles, closely enveloped, brownish-black, granular, stipitate, apiculate, jointed with the short, thick style.

Frequent on dry, wooded mountain slopes, at 3,000 to 8,000 ft. in Oaxaca; occasional in Guatemala, and single collections seen from Puebla, Honduras, Nicaragua, Costa Rica, and Panama. Southern Mexico to Brazil.



Plate 39. CAREX HUMBOLDTIANA

40. *Carex standleyana* Steyerm. (264.1)

Carex standleyana Steyerm., Ceiba 3: 23. 1952.

Cespitose; *culms* stout, up to 1 m. high, smooth; *leaves* with well-developed blades numerous, glabrous or scaberulous above, up to 50 cm. or more long, 4–8 mm. wide, their blades linear, equaling or exceeding the culms, attenuate, the midvein prominent, the sheaths strongly imbricate; *inflorescence* loosely paniculate, long-peduncled, up to 20 cm. long, the peduncles slender, elongate, densely scabrous to hirtellous, secondary panicles numerous, usually many-branched, pedunculate, the spikes sessile or very shortly pedicelled; *bracts* foliaceous, narrow, exceeding their spikes, long-sheathing at the base; *spikes* loosely flowered, androgynous, 5–7 mm. long and wide, staminate flowers 1–2, the pistillate usually 5–8, somewhat divaricate; *scales* broadly ovate, subacute, glabrous or obscurely puberulent above, green or brownish, the margins hyaline, the apex conspicuously aristate; *perigynia* ovoid, obtusely trigonous, 3.5–5 mm. long, coriaceous, many-nerved, scaberulous especially above, substipitate, abruptly contracted into a straight or curved bidentate, beak 1.5 mm. or more long, which is scaberulous on the margins; *achenes* elliptic-oblong, trigonous, 3–3.25 × 1 mm., yellowish, substipitate, apiculate.

Locally abundant on the upper forested slopes of Cerro de Uyuca, 3,000 to 6,000 ft., Department Morazan, Honduras, and known from a single collection in Guatemala (Agucate, Department Jalapa).



Plate 40. CAREX STANDLEYANA

41. *Carex polystachya* Sw. in Wahl. (265)

Carex polystachya Sw. in Wahl., Sv. Vet.-Akad. Nya Handl. 24: 149. 1803.

C. cladostachya Wahl., Sv. Vet.-Akad. Nya Handl. 24: 149. 1803.

C. mexicana Presl, Rel. Haenk. 1: 204. 1828.

C. hartwegii Boott in Benth., Pl. Hartw. 96. 1842.

C. acrolepis Liebm., Danske Vid. Selsk. V. 2: 271. 1850.

C. oerstedii Liebm., Danske Vid. Selsk. V. 2: 272. 1850.

Cespitose from short, woody rootstocks; *culms* phyllopodic, 2.5–6 dm. high, obtusely trigonous, brownish- or reddish-tinged at the fibrillose base; *leaves* with well-developed blades 6–15 to a fertile culm, mostly clustered toward the base, their blades 2–6 dm. long, 2–7 mm. wide, flat or channeled at the base, the margins revolute, thick, stiff, rough, strongly nerved, attenuate, the sheaths tight, slightly hyaline ventrally, concave and ciliate at the mouth, the ligule very short; *spikes* numerous in panicles, androgynous, 5–9 mm. long, 3–4 mm. wide, with 7–15 perigynia; *panicles* 5–10, decompound, 2–6 cm. long, 1–2 cm. wide, the upper in pairs, the lower solitary on long, rough peduncles; *rachis* hispid; *bracts* leaf-like, long-sheathing, exceeding the inflorescence; *cladophyllum* conspicuous, perigynium-like; *scales* acuminate to awned, striate, light reddish-brown or straw-colored, with green midrib often reddish-tinged; *perigynia* trigonous, narrowly ovoid, 3–3.5 mm. long, 0.9–1.25 mm. wide, ascending-spreading, membranaceous, punctulate, finely nerved and two-keeled, spongy at the stipitate base, the beak straight or curved, 0.75–1 mm. long, greenish, somewhat roughened, obliquely cut and bidentate, hyaline-tipped; *achenes* trigonous with concave sides and blunt angles, closely enveloped, brownish-black, granular, stipitate, bent-apiculate, jointed with the rather slender style.

Common in dry woodlands in the mountains. The most plentiful *Carex* in Middle America. Widespread from Nayarit, Zacatecas, and San Luis Potosi to Peru, and in the West Indies; apparently most abundant in Chiapas, Guatemala, Honduras, and Costa Rica.

41a. *Carex polystachya* var. *bartlettii* (O'Neill) Standl. & Steyererm. (265a)

Carex polystachya var. *bartlettii* (O'Neill) Standl. & Steyererm., Ceiba 4: 68. 1953.

C. bartlettii O'Neill, Carnegie Inst. Wash. Publ. 522: 255. 1940.

Differing from typical *C. polystachya* in having hispidulous perigynia and generally long-awned (up to 10 mm.) scales.

Dry, rocky mountain slopes, 4,000 to 8,000 ft. British Honduras, Guatemala, Honduras, Costa Rica, and Panama.



Plate 41. CAREX POLYSTACHYA

42. *Carex aztecica* Mack. (266)

Carex aztecica Mack., N. Amer. Fl. 18 (4) : 229. 1935.

C. fuscotincta Mack., Bull. Torrey Bot. Club 36: 478. 1909, not Merino, 1904.

Cespitose from short, thick, woody rootstocks; *culms* phyllopodic, 5–8 dm. high, obtusely triangular, reddish-brown-tinged at the fibrillose base; *leaves* with well-developed blades 7–15 to a fertile culm, their blades 1.5–3 dm. long, 2.5–5 mm. wide, thick, flat with revolute margins, scabrous above, attenuate, the sheaths tight, the ligule short; *spikes* 6–12 to a panicle, androgynous, with 5–12 perigynia, 4–7 mm. long, 3.5–6 mm. wide; *panicles* 6–10, 15–45 mm. long, 10–20 mm. wide, the lowest on a slender, scabrous peduncle about 8 cm. long, the upper in pairs; *rachis* hispid; *bracts* sheathing, those of the spikes scale-like, occasionally 3–15 mm. long; *cladophyllum* conspicuous, perigynium-like; *scales* obtuse to acute or the lower awned, dark-reddish-brown, striate, with hyaline margins and conspicuous midvein, the lower empty; *staminate flowers* few; *perigynia* narrowly obovoid, trigonous, 3–3.5 mm. long, 1.25 mm. wide, ascending, green, puncticulate, dark-reddish-brown-tinged, few-nerved, the lateral nerves conspicuous, spongy at the substipitate base, the beak less than 1 mm. long, obliquely cleft and shallowly bidentate, reddish-brown-tinged, the orifice hyaline; *achenes* trigonous with concave sides and blunt angles, 1.5–2 × 1 mm., granular, closely enveloped, short-apiculate, jointed with the short, thickish style.

Infrequent on wooded mountain slopes, 3,000 to 10,000 ft.; Michroacán, State of Mexico, Morelos, Guerrero, Oaxaca, Chiapas, and Guatemala (Department Chimaltenango).



Plate 42. CAREX AZTECICA

43. *Carex hultenii* Asplund (266.1)

Carex hultenii Asplund, Sv. Bot. Tidsk. 48 (1) : 94 (ill.), 1954.

Rootstock short, thick and woody; *culms* stout, 9 dm. high, triquetrous, with concave, striate faces, the angles moderately sharp, surrounded at the base by dried leaves, their sheaths non-fibrillose; *basal leaves* about equaling the culms, about 15 cm. wide, long-attenuate at the apex, chartaceous-coriaceous, lightly plicate along the nerves, scaberulous; *cauline leaves* 2, similar to the basal, long-sheathing, equaling or somewhat exceeding the culm; *inflorescence* decompound, 45 cm. long, interrupted at the base; *lower bracts* similar to the leaves, the lowest 5 exceeding the culm, the upper reduced; *secondary panicles* ovate-pyramidal, single at the lowest node and apex, otherwise paired at the nodes, the uppermost congested and not easily distinguishable; *peduncles* stiffly erect, subappressed to the culm, the lowest 9 cm. long, the upper reduced, the uppermost panicles sessile; *rachises* ciliate-scabrous on the angles, those of the ultimate branches also hispidulous on the face; *spikes* numerous, androgynous, 4–7 mm. long, sessile, spreading, the staminate portion shorter or sometimes about equaling the pistillate; *bracts* ovate-orbicular to orbicular, chestnut-streaked or dotted, hispidulous, 1.5–2 mm. long, the midvein prolonged into an excurrent ciliate-hispid awn up to 9 mm. long; *cladophyllum* perigynium-like, hispidulous or glabrescent; *scales* spreading to divaricate, ovate, cymbiform, subobtusate or somewhat acutish, long-mucronate (the mucro 0.5–0.75 mm. long), many-nerved, densely chestnut-striate or punctate, the lower especially hispidulous on the midvein, the upper often glabrescent; *perigynia* broadly ovoid or subglobose, more or less oblique, turgid, straw-colored, lustrous, the body 2–2.5 mm. long, 1.5–2 mm. wide, with a few very short, aculeiform hairs on the margins toward the apex, otherwise glabrous, the marginal nerves prominent above, somewhat impressed below, otherwise very faintly nerved or the nerves obsolete, almost estipitate at the gibbous base, abruptly beaked, the beak compressed, more or less oblique, about 1 mm. long, narrowly margined, minutely spinulose-serrate, bidentate, oblique at the orifice, the teeth 0.3 mm. long on the adaxial face; *achenes* trigonous, $1.75\text{--}2 \times 1$ mm., the sides shallowly concave or nearly flat, crowned with the thickened base of the scarcely deciduous style.

Known only from the type collection: at the Great Falls of the river Necaxa, in the Huachinango region, 3,000 ft., Puebla, Mexico, H. Fröderström & E. Hultén 757, Feb. 10, 1932 (S).



Plate 43. CAREX HULTENII

44. *Carex madrensis* Bailey (267)

Carex madrensis Bailey, Bot. Gaz. 25: 270. 1898.

C. polystachya var. *madrensis* (Bailey) Kükenth. in Engler, Pflanzenr. 4 (20) : 267. 1909.

Cespitose from woody, matted rootstocks; *culms* obtusely triquetrous, phyllopodic, 2.5–6 dm. high, brownish-tinged at the fibrillose base; *leaves* with well-developed blades 5–10 to a fertile culm, their blades 1–2.5 dm. long, 2.5–4 mm. wide, stiff, coriaceous, flat with revolute margins, roughened toward the attenuate apex, the sheaths tight, brownish-tinged ventrally, truncate and pubescent at the mouth, the ligule short; *spikes* 3–6 to a panicle, androgynous, with 5–15 pergynia, 7–15 mm. long, 4–6 mm. wide, the bracts awn-pointed; *panicles* 1–3, 1.5–3 cm. long, 7–15 mm. wide, the lower on slender, scabrous peduncles, the bracts sheathing, the rachis hispid; *cladoprophyllum* conspicuous, perigynium-like; *scales* obtuse to acute or the lower cuspidate, chestnut-brown with greenish center and hyaline margins, striate, the midvein prominent; *staminate flowers* inconspicuous; *perigynia* ovoid, trigonous, 4 mm. long, 1.5–2 mm. wide, appressed, membranaceous, green to olive-green, puncticulate, spongy at the stipitate base, the beak 1 mm. long, bidentulate; *achenes* trigonous with concave sides and blunt angles, closely enveloped, apiculate, jointed with the short, thickish style.

Infrequent on dry wooded or rocky mountain slopes, 4,000 to 6,500 ft.; Jalisco, Michoacan, Hidalgo, Morelos, and Guerrero (reported also from Durango), Mexico.



Plate 44. CAREX MADRENSIS

16. § BICOLORES

45. *Carex hassei* Bailey (271)

Carex hassei Bailey, Bot Gaz. 21 : 5. 1896.

C. aurea var. *celsa* Bailey, Mem. Torrey Bot. Club 1 : 75. 1889.

C. garberi var. *bifaria* Fern., Rhodora 37 : 255. 1935.

Loosely caespitose from long, very slender rootstocks; *culms* slender, erect, phyllopodic, 0.5–7 dm. high, exceeding the leaves, light-brownish-tinged at the base; *leaves* 5–7 to a culm, clustered near the base, 2–4 mm. wide, flat above, channeled near the base, the ligule about as wide as long; *terminal spike* staminate or gynaeandrous, short-peduncled, 6–20 mm. long, the staminate part 2–3 mm. wide; *pistillate spikes* 3–5, approximate or the lower separate and sometimes nearly basal, the upper short-peduncled or sessile, the lower long-peduncled, the spikes linear-oblong, 7–25 mm. long, 3.5–4.5 mm. wide, with 10–30 appressed-ascending perigynia, lower bracts leaflet-like, much exceeding the inflorescence, the upper smaller; *scales* ovate-suborbicular, obtuse to acuminate, appressed, usually somewhat shorter and narrower than the perigynia, reddish-brown with broad, lighter, three-nerved center and whitish-hyaline margins and apex; *perigynia* elliptic-obovoid, flattened-suborbicular, 2.5–3 mm. long, 1.5 mm. wide, rather obscurely ribbed, minutely granular, whitish puberulent, not fleshy nor translucent, rounded and beakless or nearly so at the apex, the orifice entire; *achenes* lenticular, 1.5×1.25 mm., brownish.

Known south of the U. S. border from a single collection: moist, sandy soil at edge of meadow, La Grulla, Sierra San Pedro Martin, 7000 ft., Baja California, Mexico, *I. L. Wiggins* 9803, May 8, 1941 (GH; MICH; US). Mackenzie and Yukon, southward to Colorado, Utah, Arizona, and Baja California.



Plate 45. CAREX HASSEI

17. § LAXIFLORAE

46. *Carex laxiflora* Lam. var. *serrulata* F. J. Herm. (296a)

Carex laxiflora var. *serrulata* F. J. Herm., *Rhodora* 40: 80. 1938.

Densely cespitose from very short rootstocks; *culms* 1.5–4 dm. high, lateral, phyllopodic, narrowly winged, white-striolate, flattened on drying, brownish at the base; *sterile shoots* long; *leaves* with well-developed blades 1–3 to a fertile culm, their blades 7–30 cm. long, 4–7 mm. wide, the sheaths long, enlarged upward, minutely serrate, thin ventrally, the ligule longer than wide; *terminal spike* staminate, 1–2.5 cm. long, 1.25–3 mm. wide; *lateral spikes* 1–4, pistillate, with 5–18 perigynia, 7–45 mm. long, 3–4 mm. wide, the lower long-peduncled; *bracts* sheathing, the lower leaf-like, the sheaths serrulate, prolonged; *scales* broadly ovate to oblong-ovate, mostly abruptly acute or truncate and rough-awned or cuspidate, white-hyaline with three-nerved, green center; *perigynia* obovoid, obtusely trigonous 3.5–4.25 mm. long, 1.2–1.5 mm. wide, appressed-ascending, membranaceous, light-green, puncticulate, finely nerved, spongy at the stipitate base, gradually narrowed into an oblique beak 0.5 mm. long, the orifice white-hyaline, entire; *achenes* trigonous with concave sides and blunt angles, 1.75×1.5 mm., closely enveloped, yellowish-brown, granular, substipitate, apiculate, jointed with the short, often bent style.

In our area known only from steep, moist slopes, 6,000 to 7,500 ft., Municipio of Teneja, Chiapas, Mexico. Massachusetts westward to Michigan and southward to Florida and southern Mexico.



Plate 46. CAREX LAXIFLORA VAR. SERRULATA

18. § GRANULARES

47. *Carex attractodes* F. J. Herm. (303.1)

Carex attractodes F. J. Herm., Jour. Wash. Acad. Sci. 40 (9) : 283. 1950.

More or less cespitose from moderately stout, dark-brown, creeping rootstocks; *culms* 1.5–4 dm. high, phyllopodic, slender, flexuous, little exceeding the leaves, bluntly triquetrous, smooth or minutely scabridulous between the veins; *leaves* 2–4 to a fertile culm, mostly on the lower third of the culm, the blades flat, erect, 5–25 cm. long, 2–6 mm. wide, linear, scaberulous toward the apex, the sheaths loose, hyaline and early ruptured ventrally, the ligule prolonged, acuminate, many times longer than wide; *staminate spike* linear, erect, subsessile and often concealed between the two uppermost pistillate spikes or short-peduncled (peduncle up to 3 mm. long), 6–12 mm. long, 1.2–2 mm. wide, the scales oblong, bluntly acute to minutely cuspidate, 3.5 mm. long, appressed-ascending, pale-reddish-brown with a broad light-green, more or less carinate midrib, usually scabridulous toward the apex; *pistillate spikes* 3 or 4, erect, the lowermost widely separate on a long-exserted, capillary peduncle, the upper short-peduncled or sessile, linear-oblong, 5–14 mm. long, 3–5 mm. wide, closely 10–25-flowered, the perigynia ascending; *bracts* large and leaflike, generally exceeding the inflorescence, the blade of the lowermost 4–12 cm. long, the sheaths long (to 24 mm.) somewhat prolonged at the mouth and the ligule conspicuous; *scales* elliptic-lanceolate, acuminate, 2 mm. long and about half the length of the perigynia, thin, hyaline and tinged with reddish-brown except for the stout, green, carinate midrib; *perigynia* fusiform, 3–3.3 mm. long, 1.5 mm. wide, sessile, prominently many-nerved, coriaceous, closely investing the achene, dark-green, shading to chestnut-brown at the base, resinous-puncticulate, tapering into a short, straight, entire beak; *achenes* trigonous, broadly obovoid, 1.8×1.1 mm., brown, granular, tapering to the short-stipitate base, abruptly rounded at the apex, conspicuously straight-apiculate, jointed with the short, slender style.

Apparently restricted to Mexico; grassy slopes, pastures, and roadside ditches from 5,000 to 12,000 ft., Federal District (one collection) and Chiapas (four collections).



Plate 47. CAREX ATTRACTODES

48. *Carex quichensis* F. J. Herm. (303.2)

Carex quichensis F. J. Herm., Jour. Wash. Acad. Sci. 40 (9) : 284. 1950.

Densely cespitose from slender, pale-brown rootstocks; *culms* 1.8–4 dm. high, erect, over-topped by the leaves, smooth, bluntly triquetrous; *sterile shoots* conspicuously developed; leaves 3–5 to a fertile culm, the blades flat, linear, erect, 9–20 cm. long, 3.5–6 mm. wide, scaberulous on the margins toward the apex, the lower sheaths loose, hyaline and soon breaking ventrally, the ligule not conspicuously prolonged, blunt, as long or twice as long as wide; *terminal spike* staminate, linear, erect, 14–25 mm. long, 1.5–2 mm. wide, borne on a peduncle 3–5 mm. long, the scales elliptic oblong, 4 mm. long, appressed, hyaline, tinged with reddish-brown, the broad dark-green, often somewhat carinate, midrib smooth and extended as a mucro; *lateral spikes* 3 or 4, erect, pistillate or often androgynous, the lowermost widely separate on a capillary peduncle, the upper short-peduncled, linear, 20–30 mm. long, 3.5–5 mm. wide at maturity, 15–30-flowered, the perigynia appressed-ascending; *bracts* leaf-like, overtopping the inflorescence, the blade of the lowermost 15–20 cm. long, the sheaths, except the uppermost, very long (to 45 mm.), prolonged at the mouth and with a prominent ligule; *scales* broadly elliptic-lanceolate, acuminate, 3 mm. long, nearly equaling the perigynia, thin and hyaline, the margins streaked with dark-red, the midrib stout, green, generally more or less carinate, extending to or prolonged slightly beyond the tip; *perigynia* broadly ellipsoid to narrowly obovoid, 3.2 mm. long, 1.3–1.5 mm. wide, sessile, conspicuously many-nerved, subcoriaceous, little inflated, olive-green, tapering at the base, abruptly contracted above into a short (0.35 mm.), stout, straight, subentire beak conspicuously thickened at the mouth; *achenes* trigonous, narrowly obovoid, 2×1 mm., stramineous, granular, tapering to the stipitate base, rounded at the apex, bent-apiculate and jointed with the slender style.

Known only from the type collection: edge of brook above Nebaj, El Quiché, 7,000 ft., Guatemala, A. J. Sharp 45144, Feb. 7, 1945 (NA; TENN).



Plate 48. CAREX QUICHENSIS

19. § LONGICAULES

49. *Carex anisostachys* Liebm. (317)

- Carex anisostachys* Liebm., Danske Vid. Selsk. Skr. V. 2: 266.
C. chlorocarpos Liebm., Danske Vid. Selsk. Skr. V. 2: 265.
1850, not Wimm., 1850.
C. olivacea Liebm., Danske Vid. Selsk. Skr. V. 2: 267. 1850, not
Boott, 1846.
C. liebmannii Walp., Ann. 3: 705. 1852. (Based on *C. chlorocarpos*
Liebm.).
C. monticola Böck., Bot. Jahrb. 1: 364. 1881. (Based on *C. olivacea*
Liebm.). Not *C. monticola* Dewey, 1861.
C. androgyna Bailey, Proc. Am. Acad. 22: 101. 1886. (Based on *C.*
olivacea Liebm.). Not *C. androgyna* Ballis, 1792.
C. oaxacana Bailey, Bot. Gaz. 25: 271. 1898. (Based on *C. olivacea*
Liebm.).
C. felipensis C. B. Clarke, Kew Bull. Add. Ser. 8: 84. 1908.

Cespitose from stout, matted, often short-creeping, woody root-stocks; *culms* aphyllopodic, 1.5–9 dm. high, slightly hairy, reddish-tinged at the base, the basal sheaths becoming filamentose; *leaves* with well-developed blades 5–10 to a fertile culm, their blades 5–15 cm. long, 1–3 mm. wide, stiff, flat with revolute margins, glabrate or minutely pubescent, rough at the attenuate apex, the sheaths tight, scabrous, reddish-brown-spotted ventrally, concave and prolonged at the mouth, the ligule short; *spikes* 3–5, the terminal androgynous, staminate, or pistillate in the center, the lateral pistillate, with 10–25 perigynia, 7–15 mm. long, 3 mm. wide, in a head 3–6 cm. long; *lower bract* sheathless or nearly so, 2–4 cm. long, shorter than to much exceeding the inflorescence, the others shorter or absent; *pistillate scales* rather obtuse to acuminate, greenish-hyaline, with three-nerved green center, reddish-brown-tinged; *perigynia* oval-obovoid, trigonous, somewhat flattened, 2.5–4 mm. long, 1.25 mm. wide, ascending, membranaceous, green, punctulate, slenderly few-nerved, substipitate, abruptly contracted into a short-cylindric, whitish-tipped, obliquely cut, emarginate or shallowly bidentate beak 0.5 mm. long; *achenes* sharply trigonous, oblong-ovoid with concave sides, 1.5 × 2.5 mm. long, brownish, punctulate, apiculate, jointed with the short style.

Frequent on wooded mountains and slopes, 3,000 to 12,000 ft.; Hidalgo, State of Mexico, Federal District, Oaxaca, Chiapas, and Guatemala.



Plate 49. CAREX ANISOSTACHYS

50. *Carex guatemalensis* F. J. Herm. (317.1)

Carex guatemalensis F. J. Herm., Brittonia 23 (2) : 145. 1971.

Cespitose from short- to long-creeping, woody rootstocks; *culms* phyllopodic, 10–35 cm. high, much exceeding the leaves, more or less pilose and ciliate on the angles above; *leaves* with well-developed blades 5–8 to a fertile culm, clustered toward the base, their blades flat, 4–11 cm. long, 1.5–3 mm. wide, long-attenuate and scabrous-ciliate at the apex, the sheaths densely pilose ventrally, the ligule wider than long; *spikes* 2–5, contiguous, sessile or very short-peduncled, the terminal usually gynaeceandrous, 5–12 mm. long, 3–6 mm. wide, the lateral pistillate, 4–9 mm. long, 2.5–3 mm. wide, densely flowered, with 5–12 perigynia, erect-ascending; *bracts* sheathless, leaf-like, linear-subulate, much exceeding the inflorescence, pilose at the base; *scales* ovate-lanceolate, acute or acuminate, reddish-brown with hyaline margins, sometimes more or less pilose dorsally, three-fourths the length of the perigynia; *perigynia* elliptic-lanceolate, trigonous, 3–3.5 mm. long, 1–1.25 mm. wide, not inflated, membranaceous, pale-green becoming pale-brown, often irregularly red-punctate, glabrous or with the margins and beak sparsely pilose, several-nerved, the marginal ribs prominent, sessile, rather abruptly contracted to the substipitate base, gradually narrowed into a straight, often ciliate beak 1–1.25 mm. long; *achenes* trigonous, obovoid, 2×0.75 mm., straw-colored, granular, abruptly contracted into a substipitate base.

Locally frequent on dry, rocky, grassy slopes, meadows, and rocky limestone outcrops, 9,000 to 12,000 ft., Departments of Huehuetenango and Quezaltenango, Guatemala.



Plate 50. CAREX GUATEMALENSIS

51. *Carex longicaulis* Böck. (318)

Carex longicaulis Böck., Flora 65: 62. 1882.

C. ciliaris Fern., Proc. Am. Acad. 43: 61. 1907.

Loosely cespitose and short-stoloniferous, from long, stout, matted rootstocks; *culms* phyllopodic, 2.5–6 dm. high, stiff, sparingly pubescent, brownish-tinged at the base, the old leaves conspicuous; *leaves* with well-developed blades 6–12 to a fertile culm, clustered near the base, their blades 5–20 cm. long, 2.5–3.5 mm. wide, flat with revolute margins, light-green, ciliate and sparingly pilose below, papillose, roughened toward the attenuate apex, the sheaths sparingly pilose dorsally, slightly yellowish-brown-tinged ventrally, the ligule much wider than long; *terminal spike* staminate, androgynous or pistillate in the middle, 12–18 mm. long, 2–3 mm. wide; *lateral spikes* 2–5, pistillate, with 10–25 perigynia, 6–18 mm. long, 4–6 mm. wide; *lowest bract* leaf-like short-sheathing, exceeding the inflorescence, the upper reduced; *scales* acute to acuminate or cuspidate, white- or whitish-hyaline, with three-nerved green, straw-colored, or brownish center; *perigynia* trigonous, obovoid 4 mm. long, 2 mm. wide, ascending, membranaceous, light-green, punctulate, obscurely nerved, tapering at the base, rather abruptly beaked, the beak 0.5–1 mm long, flattened-subconic, obliquely cleft, bidentulate; *achenes* obovoid, trigonous with concave sides, 2.5×1.75 mm., closely enveloped, substipitate, apiculate, jointed with the short style.

Frequent to locally common on dry, open slopes, and open woods, 6,000 to 11,000 ft., Jalisco, Hidalgo, State of Mexico, Federal District, Tlaxcala, and Oaxaca.



Plate 51. CAREX LONGICAULIS

52. *Carex coulteri* Boott (319)

Carex coulteri Boott in Hemsl., Biol. Centr. Am. Bot. 3: 473. 1885.
C. longicaulis var. *coulteri* (Boott) Kükenth. in Engler, Pflanzenr.
4(20): 580. 1909.

Loosely cespitose from stout, matted, somewhat elongate rootstocks; *culms* phyllopodic, 6–8 dm. high, slender, short-pubescent, brownish-tinged at the base, the old leaves conspicuous; *leaves* with well-developed blades 5–10 to a fertile culm, clustered on the lower half, their blades 2–3 dm. long, 2–3 mm. wide, stiff, flat with revolute margins, densely villous beneath, sparsely pilose above, attenuate, the sheaths villous dorsally, yellowish-brown ventrally, concave at the mouth, the ligule short; *terminal spike* staminate, short-peduncled to subsessile, 15–25 mm. long, 2–3 mm. wide; *lateral spikes* about 4, the 2 upper approximate, the others more or less separate, pistillate, with 10–25 perigynia, 8–15 mm. long, 4–6 mm. wide; *lower bracts* leaf-like, the upper reduced; *scales* acute to mucronate, sparsely pilose, hyaline with three-nerved, greenish or yellowish center; *perigynia* obovoid, sharply trigonous, 3.5 mm. long, 1.75 mm. wide, ascending, membranaceous, light-green, short-pilose, three-nerved on each face, the beak flattened-subconic, 0.75 mm. long, bidentate, the teeth hyaline; *achenes* trigonous with concave sides, 2.25×1.5 mm., closely enveloped, apiculate, jointed with the short style.

Frequent in open woods and on scrubby mountain slopes, 7,000 to 9,000 ft., in central Mexico; Hidalgo, State of Mexico, Federal District, and Veracruz.



Plate 52. CAREX COULTERI

20. § VIRIDIFLORAE

53. *Carex viridiflora* Mack. (322)

Carex viridiflora Mack., N. Amer. Fl. 18 (5) : 275. 1935.

C. viridis Schlecht. & Cham., Linnaea 6 : 30. 1831, not Honck, 1792.

Densely caespitose from very short rootstocks; *culms* phyllopodic, 2–6 dm. high, triquetrous with concave sides, roughened above, reddish-tinged at the base, the sterile shoots long; *leaves* with well-developed blades 6–9 to a fertile culm, widely separate, their blades 1–2.5 dm. long, 2–3 mm. wide, channeled above, keeled below, the margins revolute, thin, sparsely hirsute, rough above, attenuate, the sheaths hispidulous, reddish-dotted or -blotched ventrally, the ligule longer than wide; *spikes* 5–8, with 15–40 perigynia, androgynous or the terminal staminate also below, 3–8 cm. long, 2.5 mm. wide, the staminate part 3–8 mm. long, the lower separate and nodding; *lowest bract* long-sheathing, the upper reduced; *scales* acute to cuspidate, thin, hyaline, keeled, yellowish-brown-tinged with green midrib; *perigynia* ellipsoid, obtusely trigonous, 3.5 mm. long, 0.9 mm. wide, appressed-ascending, membranaceous, green, two-ribbed, stipitate, the beak 0.6–0.8 mm. long, flattened, sparsely ciliate-serrulate, obliquely cut, bidentate or bidentulate, the apex hyaline; *achenes* trigonous with concave sides, 2×0.8 mm., closely enveloped, yellowish, substipitate, apiculate, jointed with the style.

Rare. Moist, grassy mountain slopes in southern Mexico; Oaxaca, and Veracruz.



Plate 53. CAREX VIRIDIFLORA

54. *Carex pertenuis* Bailey (323)

Carex pertenuis Bailey, Mem. Torrey Bot. Club 1: 9. 1889.

"*C. viridis* Jungh.", Kükenth. in Engler, Pflanzenr. 4(20): 550, in part. 1909.

Loosely cespitose from long, slender, stoloniferous rootstocks; *culms* mostly central and phyllopodic, 2.5–8 dm. high, slender, weak, bluntly triquetrous, reddish-tinged at the base; sterile shoots long; *leaves* with well-developed blades 5–8 to a fertile culm, on the lower half, the basal clustered, their blades 1–3 dm. long, 2–4 mm. wide, flat, channeled at the base, keeled below, thin, with revolute margins, deep-green, roughened toward the attenuate apex, the sheaths reddish-brown-tinged ventrally, the ligule as long as wide; *spikes* 3–7, androgynous, with 10–30 perigynia, 2.5–5 cm. long, 3 mm. wide, the staminate part 6–12 mm. long; *lower bract* long-sheathing, the upper reduced; *scales* obtuse to cuspidate or the pistillate rough-awned, reddish-brown with lighter midrib and minutely hyaline margins; *perigynia* obtusely flattened-trigynous, 3.25 mm. long, 1 mm. wide, appressed-ascending, membranaceous, dull-green, reddish-spotted, punctulate, two-ribbed and finely nerved, stipitate, tapering at the apex, scarcely or very minutely beaked, the orifice entire; *achenes* trigynous with concave sides, 2×0.8 mm., closely enveloped, blackish, substipitate, apiculate, jointed with the style.

Rare. Mountain slopes in southern Mexico (Veracruz); known also in Guatemala from a single collection: cloud forest 4 mi. east of San Mateo Ixtatan on road to Barillas, 8,500 ft., Cuchumatanes, D. E. Breedlove 8742, Feb. 1965 (DS).

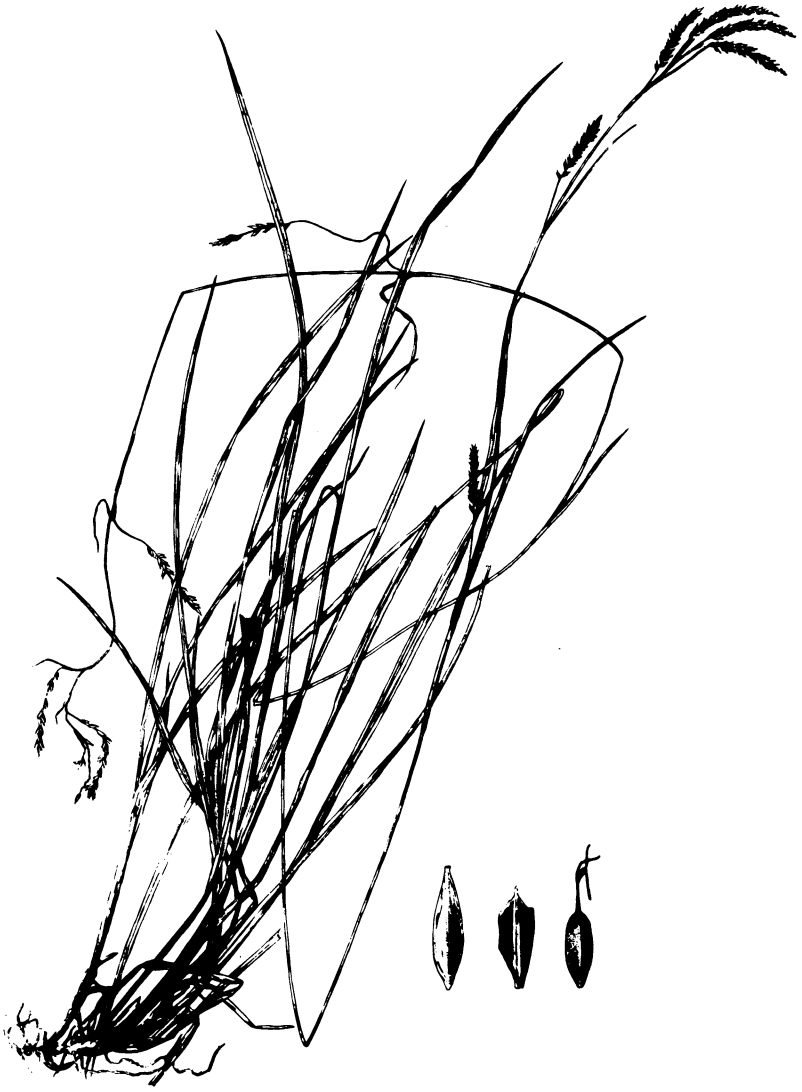


Plate 54. CAREX PERTENUIS

55. *Carex perlonga* Fern. (324)

Carex perlonga Fern., Proc. Amer. Acad. 43: 61. 1907.

Cespitose from short, stout rootstocks; *culms* partly central and phyllopodic, partly lateral and aphyllpodic, 5–9 dm. high, rather stout and reddish-tinged at the base, the lower sheaths breaking and becoming somewhat filamentose; *leaves* with well-developed blades 5–10 to a fertile culm, their blades 15–35 cm. long, 3.5–5.5 mm. wide, flat with revolute margins, thin, roughened toward the attenuate apex, the sheaths hispidulous, yellowish-brown-tinged and red-spotted ventrally, concave and red-tinged at the mouth, the ligule longer than wide; *spikes* 6–12, androgynous, with 30–80 perigynia, 8–12 cm. long, 3–4.5 mm. wide, the staminate part 15–30 mm. long; *lower bract* leaf-like, long-sheathing, the sheaths red-tinged at the mouth, the upper reduced; *scales* acute to awned, keeled, thin, dull-reddish-brown with dull-hyaline margins and one- three-nerved, green center; *perigynia* ellipsoid, obtusely trigonous, membranaceous, green, puncticulate, two-ribbed and finely nerved, stipitate, the beak 1.5 mm. long, obliquely cut, bidentate, hyaline at the orifice; *achenes* trigonous, 2.5×0.75 mm., closely enveloped, yellowish, substipitate, apiculate, jointed with the straight, slender style.

Known only from two collections: barranca below Trinidad Iron Works, 5,200 ft., Hidalgo, *C. G. Pringle 8863* (type), June 2, 1904 (GH; US), and hedgegrow in shade, 6,500 ft., San Miguel, Jalapa, Veracruz, *E. K. Balls 4802*, June 3, 1938 (US).



Plate 55. CAREX PERLONGA

56. *Carex mackenziana* Weatherb. (324.1)

Carex mackenziana Weatherb., Contr. Gray Herb. No. 114: 36. 1936.

Cespitose from short rootstocks; *culms* 6–10 dm. high, stout toward the base, more slender above, smooth, much exceeding the leaves; *leaves* with well-developed blades several to a fertile culm, clustered toward the base, glabrous, their blades 10–30 cm. long, 5–6 mm. wide, flat, long-acuminate, many-striate when dried, the margin and primary nerves scaberulous, the sheaths loose, chestnut-brown-tinged, a single reduced leaf, 9–15 cm. long, 3–4 mm. wide at midculm; *spikes* 3–5, with 30–50 perigynia, androgynous (except for the uppermost which are staminate or bearing a few irregularly placed pistillate flowers), linear-cylindric, 3–5 cm. long, 4–6 mm. wide, the lower widely separate, single, pendant, the upper approximate, sometimes paired, ascending, the very slender peduncles up to 4 cm. long; *lowest bract* with a sheath 4–5 cm. long, almost closed at the herbaceous mouth, the blade narrowly linear, up to 8 cm. long, the upper similar but reduced, all blade-bearing; *scales* acute, somewhat obtuse or short-mucronate, about equaling the perigynia, straw-colored or white-hyaline, the midvein green, three-nerved; *perigynia* ellipsoid or somewhat obovoid, trigonous, 3.5–4 mm. long, about 1.75 mm. wide, conspicuously two-nerved, the sides nerveless or lightly-few-nerved, obscurely puncticulate, sparsely strigose-puberulent or glabrescent with ciliolate angles, rather abruptly contracted into the at length bidentate beak 0.5–0.75 mm. long; *achenes* obovoid, trigonous with concave sides, 2.5 × 1.5 mm., yellowish, smooth, rounded at the base, broadly apiculate; *stigmas* brown, slender, elongate.

Known only from the type collection: common in moist oak wood, about Puerto Santa Ana, Ranchito de Cieneguillas, Hacienda Pablillo, Sierra Madre Oriental, about 15 mi. southwest of Galena, Nuevo Leon, Mexico, C. H. & M. T. Mueller 892, June 28, 1934 (GH; US).



Plate 56. CAREX MACKENZIANA

57. *Carex venosivaginata* Standl. & Steyerl. (324.2)

Carex venosivaginata Standl. & Steyerl., Ceiba 4: 67. 1953.

Loosely caespitose from short rootstocks; *culms* 2.5–6 dm. high, thick below the middle but slender at the red-tinged base, erect, triquetrous, smooth, the lower sheaths breaking and becoming very slightly filamentose; *leaves* with well-developed blades 5–10 to a fertile culm, septate-nodulose, the lower clustered at the base, their blades erect, 1–1.5 dm. long, 2.5–4.5 mm. wide, firm-membranaceous to subcoriaceous, flat with slightly revolute, scabrous margins, the sheaths glabrous; *spikes* 4–6, mostly androgynous, widely separate, paired or single, elongate-linear, 1.5–4 cm. long, 3.5–4 mm. wide, closely flowered above, loosely so at the base, the upper fourth or fifth staminate; *lower bract* leaf-like, long-sheathing, shorter than the inflorescence, the upper much reduced; *scales* broadly ovate to suborbicular-ovate, 2.6–3 mm. long, about 2 mm. wide, membranaceous, subcucullate, carinate, abruptly acuminate; *perigynia* narrowly oblong-ellipsoid, obtusely trigonous, 2.6–3.1 mm. long, 0.8–1.1 mm. wide, glabrous, punctulate, conspicuously three- four-nerved on each face, tapering to the somewhat rounded, substipitate base and into the smooth, short, obliquely cut, at length bidentulate beak, 0.8–1 mm. long; *achenes* elliptic-oblong, trigonous, 2 × 1 mm., rufous-brown, filling four-fifths of the perigynium-body, apiculate, jointed with the slender style.

Known only from the Sierra de los Cuchumatanes, 7,500 to 11,000 ft., Dept. of Huehuetenango, western Guatemala: in cloud forest, Cerro Huitz, between Mimanhuiz and Yulhuiz, *J. A. Steyermark* 48554, July 14, 1942 (type; F), and on high bluffs in upper reaches of barranco, above San Juan Ixcay, *J. A. Steyermark* 50062, Aug. 4, 1942 (F).



Plate 57. CAREX VENOSIVAGINATA

58. *Carex huehuetica* Standl. & Steyerm. (324.3)

Carex huehuetica Standl. & Steyerm., Field Mus. Publ. Bot. 23: 195. 1947.

Densely caespitose from short, stout rootstocks; *culms* slender, erect, 6 dm. high or more, obtusely triquetrous, smooth, reddish-brown below the nodes; *leaves* with well-developed blades numerous, their blades 12–27 cm. long, 5–15 mm. wide, narrowly attenuate, prominently nerved, inconspicuously septate, flat, the margins smooth, the sheaths broad and loose, dark-reddish-brown; *spikes* few to many, on very long, slender peduncles, apparently pendulous, the terminal staminate, the lateral pistillate or in part androgynous, linear, mostly 3–4.5 cm. long, loosely and rather remotely flowered; *bracts* short, filiform, erect, long-sheathing, the sheaths up to 1 cm. long, reddish-brown; *scales* oblong-oval, about 2.5 mm. long, pale-brownish or brownish-green, abruptly contracted at the apex and terminated by an awn up to 5 mm. long; *perigynia* lanceolate-fusiform, compressed-trigonous, 3.5 mm. long, 1 mm. wide, greenish, glabrous, conspicuously several-nerved, gradually narrowed into a very short, emarginate beak.

Known only from the type (over-ripe) collection: along stream of Canana, Sierra de los Cuchumatanes, about 8,200 ft., J. A. Steyermark 49055, July 18, 1942 (F).



Plate 58. CAREX HUEHUETICA

59. *Carex steyermarkii* Standl. (324.4)

Carex steyermarkii Standl., Field Mus. Publ. Bot. 23: 196. 1947.

Apparently cespitose; *culms* erect, rather stout, 5–10 dm. high, smooth, striate; *leaves* numerous, large and wide, clustered toward the base, their blades up to 40 cm. long, 16–24 mm. wide, flat rather thick, almost glossy above, paler beneath, the midrib conspicuous, the margins smooth, subulate-acuminate, dilated and sheathing, deep-brownish-red at the base, the sheath extremely thin and fragile ventrally, early disintegrating; *spikes* numerous, androgynous, forming a rather large, loose inflorescence, on long, slender, pendulous peduncles, elongate-linear, up to 6 cm. long, loosely flowered, the lowermost flowers often remote; *scales* lanceolate-oblong, acute, inconspicuously mucronate or blunt, pale-dirty-brown or pale-greenish-brown; *perigynia* obtusely trigonous, lanceolate-fusiform, 3.5–4.5 mm. long, 1–1.25 mm. wide, pale-dirty-brown, glossy, conspicuously nerved, smooth, gradually narrowed into a short, thick, erect, emarginate, beak; *achenes* trigonous, 2.5×1.25 mm., brown, apiculate.

Known from two collections: Cerro Huitz, between Barillas and Mimanhuitz, Sierra de los Cuchumatanes, 5,000 to 8,500 ft., Dept. of Huehuetenango, Guatemala, J. A. Steyermark 48542, July 14, 1942 (type F), and slope with *Quercus* and *Abies* in Colonia Ach'lum 8,600 ft., Mun. de Tenajapa, Chiapas, Mexico, A. S. Ton 868, Apr. 26, 1966 (US; DS).



Plate 59. CAREX STEYERMARKII

60. *Carex caxinensis* F. J. Herm. (324.5)

Carex caxinensis F. J. Herm., Brittonia 23 (2) : 146. 1971.

Cespitose from apparently short-creeping rootstocks; *culms* phyllopodic, bluntly triquetrous, up to 6 dm. high, much exceeding the leaves, the lower sheaths red-tinged; *leaves* 2–3 on the fertile culms with 2–5 at their base, their blades linear, attenuate, 15–30 cm. long, 3–4 mm. wide, flat or with the margins slightly recurved, strongly coriaceous, with scabrous-serrulate margins and smooth, reddish sheaths; *spikes* 5–7, androgynous, on long, filiform, cernuous peduncles, the lower remote and few-flowered, the upper contiguous and dense-flowered, linear-cylindric, 2.5–4.5 cm. long, 4–6 mm. wide, with 20–50 ascending perigynia; *lowest bract* leafy, shorter than the inflorescence, long-sheathing, the sheath red ventrally; *scales* elliptic-ovate or ovate-lanceolate, appressed, acuminate or short-awned, wider than the perigynia and for the most part concealing them, more or less keeled, membranaceous, red with a conspicuous straw-colored midrib; *perigynia* fusiform, 3–4 mm. long, 1–1.5 mm. wide, obtusely trigonous, glabrous, pale-green or purplish-red especially toward the base, two-ribbed and strongly about 10-nerved, abruptly contracted at the base into a stipe 0.5–0.75 mm. long, contracted above into a short, thick, praemorse beak with a minutely serrulate orifice; *achenes* obovoid, trigonous, 2 × 1 mm., substipitate, not constricted in the middle.

Known only from a single collection: on Caxin bluff, summit of Sierra de los Cuchumatanes, 12,000 ft., Dept. of Huehuetenango, Guatemala, *J. A. Steyermark* 50175, Aug. 6, 1942 (distributed as *C. tojquianensis* Standl. & Steyererm.) (F — holotype).



Plate 60. CAREX CAXINENSIS

21. § SYLVATICAE

61. *Carex conspecta* Mack. (346)

Carex conspecta Mack., N. Am. Fl. 18 (5) : 294. 1935.

Cespitose from short, stout, rootstocks; *culms* phyllopodic, 6–12 dm. high, 4–6 mm. wide at the dull-reddish-brown-tinged base, nodding, the lower sheaths filamentose; *leaves* with well-developed blades 5–8 to a fertile culm, clustered on the lower fourth, their blades 2–4 dm. long, 3–6 mm. wide, channeled above, flat below, thick, many-nerved, roughened toward the attenuate apex, the margins revolute, the sheaths roughened dorsally between the nerves, thin-hyaline and cinnamon-brown-dotted ventrally, the ligule longer than wide; *terminal spike* staminate, 4 cm. long, 3.5 mm. wide; *lateral spikes* 6, the upper two staminate, the lower four androgynous, 2–3 cm. long, 5 mm. wide, with 20–50 perigynia, dropping on slender peduncles; *lowest bract* leaf-like, long-sheathing, the upper reduced; *scales* ovate, wider but somewhat shorter than the perigynia, reddish-brown with lighter midvein and whitish-hyaline, erose margins, emarginate, mucronate; *perigynia* compressed-trigonus, 2.25 mm. long, 1 mm. wide, ascending or spreading, membranaceous, straw-colored, red-dotted, puncticulate, two-ribbed and finely many-nerved, substipitate, rather abruptly contracted into a bidentate beak 0.5 mm. long; *achenes* trigonus with concave sides. 1.5×0.8 mm., closely enveloped, brownish, subapiculate, jointed with the style.

Mexico: between the haciendas Santa Barbara and Cristo sur l'Alseseca, 7,000 ft., vicinity of Puebla, State of Puebla, *Bro. G. Arsène* 1359, Aug. 1, 1907 (US—type); Desierto de los Leones, Federal District, *E. Lyonnet* 2132 & 2590, July and Sept. 1938 (US).



Plate 61. CAREX CONSPECTA

22. § LONGIROSTRES

62. *Carex tunimanensis* Standl. & Steyerl. (349.1)

Carex tunimanensis Standl. & Steyerl., Ceiba 4: 65. 1953.

Cespitose from stout, tough, very strongly fibrillose, creeping rootstocks; culms 0.9–5 dm. high, phyllopodic, erect, moderately slender, bluntly triquetrous, smooth, exceeding the leaves, not red-tinged at the base; leaves 4–6 to a fertile culm, mostly clustered at the base of the culms, weakly septate-nodulose toward the base, their blades flat, erect, 5–40 cm. long, 2.5–5.5 mm. wide, very long-attenuate, glabrous, the margins and midrib beneath serrulate above the middle, the sheaths short, hyaline ventrally becoming brown toward the minutely ciliate mouth, conspicuously striate at the base, the ligule wider than long, inverted (concave rather than convex); spikes 4–15, the lower generally solitary, the upper in clusters of 3–4, the terminal 1–4 androgynous with few pistillate flowers or staminate, erect, short-peduncled to subsessile, the lateral pistillate, oblong, 1.5–6 cm. long, 4–8 mm. wide, tapering at apex and base, drooping on long (4–9 cm.), filiform peduncles, rather densely flowered, the perigynia 50–75, ascending; bracts long-sheathing, foliaceous, the blades linear, attenuate, shorter than the inflorescence, the upper half scabrous on the margins and midrib beneath, the upper bracts reduced; pistillate scales ovate-lanceolate, acute to short-cuspidate, pale-brown with broad, hyaline margins, somewhat keeled, wider than and nearly as long as the perigynia; perigynia fusiform, flattened-trigonal, 4.5–5.5 mm. long, 1–1.5 mm. wide, not inflated, glabrous, pale-green, ventrally nerveless but with prominent marginal ribs, lightly three-five-nerved dorsally, gradually tapering into a smooth, terete, hyaline beak one-third to one-half the length of the body, 1–1.5 mm. long, brownish at the base, especially dorsally, the white-hyaline orifice obliquely cut and bidentulate; achenes flattened-trigonal, broadly ellipsoid, 2×1.25 mm., stramineous, tapering to the stipitate base, apiculate, jointed with the style.

Evidently rare and local. Known from three collections: steep slope with *Quercus* and *Magnolia* at the Paeaje Matsab, 9,000 ft. Municipio of Tenejapa, Chiapas, Mexico, A. S. Ton 941, May 12, 1966 (DS; MICH); alpine areas in vicinity of Tunima, Sierra de los Cuchumatanes, 11,000 to 11,500 ft., Huehuetenango, Guatemala, J. A. Steyermark 48283, July 6, 1952 (F) and, long rivulet, alpine meadows just northwest of Chancol, Huehuetenango, Guatemala, J. A. Steyermark 48251, July 6, 1952 (F).



Plate 62. CAREX TUNIMANENSIS

23. § EXTENSÆ

63. *Carex distentifformis* F. J. Herm. (359.1)

Carex distentifformis F. J. Herm., Brittonia 23 (2) : 146. 1971.

Rhizome short, thick, woody; *culms* phyllopodic, 8–10 dm. high, bluntly triquetrous, exceeding the leaves; *leaves* with well-developed blades 7–13 to a fertile culm, clustered (except for 2–4 on the culm) at the base, long-sheathing, their blades coriaceous, flat, becoming strongly revolute when dry, 4–5.5 mm. wide, long-attenuate and scaberulous at the apex, the sheaths thin-membranaceous ventrally, the ligule wider than long; *inflorescence* nearly paniculate, 5.5–10 cm. long, except for the widely separate lowermost spike (often compound); *spikes* 4–7, cylindric, 0.6–5 cm. long, 6–8 mm. wide, densely-flowered, the terminal staminate (rarely perfect), the lateral pistillate (sometimes staminate at the apex), ascending, sessile or more or less pedunculate; *bracts* leaf-like, much exceeding the inflorescence, long-sheathing; *scales* persistent, ovate-lanceolate, acute or abruptly acuminate, 3–3.5 mm. long, slightly shorter than the perigynia, wide-spreading at maturity of perigynia, red-streaked, three-nerved, the midnerve excurrent as a short, ciliate-hispidulous awn; *perigynia* horizontally spreading, unequally ovoid, plano-convex or gibbous, turgid, reddish-brown, spotted with dark-red, many-nerved, 3.25–4 mm. long, 1.3–1.8 mm. wide, contracted into a bidentate beak 1 mm. long; *achenes* trigonous, elliptic-obovoid, 2–2.5 × 1.25–1.5 mm., punctate, brownish.

Known only from two collections from the Municipio of Amatenango del Valle, Chiapas, Mexico: slope with *Quercus* along creek near center of Amatenango, alt. 5,900 ft., *D. E. Breedlove* 12152, Aug. 23, 1965 (DS; F; IPN; USFS), and, large, moist pasture at Amatenango del Valle, 5,800 ft., *D. E. Breedlove* 14589, July 27, 1966 (type, US: isotype, DS).



Plate 63. CAREX DISTENTIFORMIS

24. § VIRESCENTES

64. *Carex boliviensis* Van Juerck & Müll.-Arg. (375)

Carex boliviensis Van Juerck & Müll.-Arg. in Van Juerck, Obs. Myc. 32. 1870.

C. galbana Bailey, Bot. Gaz. 25: 271. 1898.

Cespitose from elongate, woody rootstocks; *culms* phyllopodic, 5–45 cm. high, sharply triquetrous, rough on the angles, very slender and becoming decumbent, brownish and fibrillose at the base, the old leaves conspicuous; *leaves* with well-developed blades 5–10 to a fertile culm, clustered near the base, their blades 2.5–10 cm. long, 1.5–3 mm. wide, stiff, flat or channeled, glaucous-green, pubescent at the base, especially on the margins, the apex slender with revolute margins, the sheaths yellowish-brown-tinged and reddish-brown-spotted, truncate at the mouth, the ligule very short; *spikes* 2–3, the terminal gynaeandrous, 8–16 mm. long, 4–5 mm. wide, the lateral pistillate, shorter, with 10–25 perigynia; *bracts* sheathless, the lowest scale-like, long-awned, shorter than the inflorescence, an empty, leaf-like bract sometimes 1 cm. or less below the spikes; *scales* obtuse to acutish or mucronate, reddish-brown with hyaline margins and lighter three-nerved center; *perigynia* elliptic-ovoid, flattened-trigonus, 3 mm. long, 1.75 mm. wide, erect-ascending, subcoriaceous, light olive-green, puncticulate, granular, strongly ribbed dorsally, lightly nerved ventrally, beakless, the apex minutely emarginate; *achenes* trigonous with concave sides, 2×1.25 mm., yellowish-brown, granular, stipitate, apiculate, jointed with the short, rather thick style.

Occasional on grassy slopes and in alpine meadows at 8,000 to 13,000 ft.; seen from Durango, Puebla, and Guerrero, Mexico. Mexico to Argentina.



Plate 64. CAREX BOLIVIENSIS

65. *Carex complanata* Torr. & Hook. (376)

Carex complanata Torr. & Hook. in Torr., Ann. Lyc. N. Y. 3: 408. 1836.

C. triceps Michx., Fl. Bor. Am. 2: 170. 1803, not Schrank, 1789.

Cespitose; *culms* 2–6 dm. high, aphyllopodic, triquetrous with concave sides, slender, stiff and erect, red at the base; *leaves* with well-developed blades 4–6 to a culm, clustered toward the base, the blades 1–3 dm. long, 1.5–3 mm. wide, rather thick and stiff, flat but the margins revolute, glabrate, attenuate, the sheaths long, tight, sparingly hairy, concave and short-pilose at the mouth, the ligule wider than long; *spikes* 2–5, the terminal gynaeceandrous, the lateral pistillate, 15–30-flowered, 6–15 mm. long, 5–7 mm. wide; *lowest bract* leaf-like, much exceeding the inflorescence, not sheathing; *pistillate scales* obtuse to acuminate or awned, straw-colored and reddish-brown-tinged with green center and hyaline margins; *perigynia* flattened-trigonous, 2–2.5 mm. long, 1.2–1.6 mm. wide, appressed or ascending, submembranaceous, granular-roughened and asperulous, olive-green, nerved dorsally and on the margins, beakless, the orifice emarginate; *achenes* trigonous with concave sides and prominent rounded angles, 1.75×1.25 mm., stipitate, bent-apiculate, jointed with the rather short and thick style.

In our area known only from Chiapas, Mexico, where it is occasional on oak-pine slopes at 5,000 to 9,500 ft.



Plate 65. CAREX COMPLANATA

25. § FECUNDAE

66. *Carex tuberculata* Liebm. (389)

Carex tuberculata Liebm., Danske Vid. Selsk. Skr. V. 2: 270. 1850.

Cespitose from long, stout rootstocks; *culms stout*, stiff, 6–9 dm. high, phyllopodic, triquetrous with concave sides, rather rough above, cinnamon-brown-tinged at the base; *leaves* on the lower third of the culm, the blades 2.5–5 dm. long, 4–8 mm. wide, channeled above, keeled below, with revolute margins and prominent midrib, coriaceous, sparingly septate-nodulose, glaucous-green, roughened toward the attenuate apex, the sheaths thin ventrally and yellowish-brown-tinged and red-dotted, concave at the mouth, sparingly filamentose, the ligule nearly as long as wide; *spikes* 7–16, androgynous, 3–6 cm. long, 4–5 mm. wide, in pairs or threes on slender, drooping, roughened peduncles, 25–75-flowered; *lowest bract* leaf-like, the upper reduced; *pistillate scales* obtuse to acutish or cuspidate, reddish-brown with white-hyaline margins and paler center; *perigynia* obtusely trigonous, 2–2.5 mm. long, 1.5 mm. wide, spreading-ascending, inflated, membranaceous, pale-green, dotted with red, resinous glands, two-keeled, the beak 0.5 mm. long, bidentate with hyaline orifice; *achenes* 1.5–2 × 1.25–1.5 mm., trigonous with prominent angles and the sides convex above, constricted in the middle, granular, resinous, bent-short-apiculate, jointed with the style.

Rare; known only from two collections from Mexico: Chinantla, 7,000 ft., Puebla, *Liebman 563* (CP), and Montes de San Rafael, State of Mexico, *E. Lyonnet 724*, Oct. 1930 (GH).



Plate 66. CAREX TUBERCULATA

66a. *Carex tuberculata* var. *ehrenbergiana* (Böck.) Kükenth.
(390)

Carex ehrenbergiana Böck., *Linnaea* 4: 175. 1877.

C. tuberculata var. *ehrenbergiana* (Böck.) Kükenth. in Engler,
Pflanzenreich 4(20): 408. 1909.

Differs from *Carex tuberculata* in having the lower sheaths usually red-tinged instead of cinnamon-brown, the upper spikes staminate or nearly so instead of androgynous, the perigynia more broadly obovoid and only obscurely resinous, the beak only shallowly bidentate, the achenes broader (obovoid rather than oblong-obovoid), and spikes up to 10, instead of only 6, cm. long. These distinctions are not always correlated, and none of them is constant.

Infrequent along banks of streams and in damp woods in the mountains at 9,500 to 11,500 ft.; State of Mexico, Federal District, and Hidalgo.



Plate 66a. CAREX TUBERCULATA VAR. EHRENBURGIANA

67. *Carex psilocarpa* Steud. (391)

Carex psilocarpa Steud., Syn. Cyp. 195. 1855.

C. maculata Liebm., Danske Vid. Selsk. Skr. V. 2. 1850, not Boott, 1846.

C. consors C. B. Clarke, Kew Bull. Add. Ser. 8: 76. 1908.

Rootstocks stout, horizontal; *culms* 5–9 dm. high, stout, stiff, triquetrous with concave sides, phyllopodic, Burgundy-red at the base; *leaves* with well-developed blades 8–15 to a fertile culm, the blades 3–6 dm. long, 6–10 mm. wide, keeled below with revolute margins and prominent midrib, coriaceous, sparingly septate-nodulose, glaucous, roughened toward the attenuate apex, the sheaths thin, yellowish-brown-tinged and red-dotted ventrally, concave at the mouth, the ligule nearly as long as wide; *spikes* 8–12, androgynous, 25–75-flowered, 2–12 cm. long, 4–6 mm. wide, flexuous or drooping on slender, rough peduncles in pairs; *lower bracts* leaf-like, red-tinged at the base, the upper reduced; *pistillate scales* obtuse to acute or cuspidate, reddish-brown with hyaline margins and lighter three-nerved center; *perigynia* obtusely trigonous, inflated, 3.5–4 mm. long, 1.5 mm. wide, ascending or spreading, membranaceous, greenish-straw-colored, reddish-dotted, two-keeled and finely nerved, substipitate, the beak 0.5 mm. long, minutely notched and ciliate at the apex, dark-tinged; *achenes* trigonous with rounded angles and sides convex above, 2×1.25 mm., constricted in the middle, brownish-black, bent-apiculate, jointed with the curving style.

Occasional in damp woods, swamps or on stream banks in the mountains at 5,000 to 11,000 ft.; Mexico (Veracruz, Hidalgo, State of Mexico, Federal District, and Oaxaca), Honduras and Salvador.

The illustration for this species by Creutzburg in Mackenzie's North American Cariceae was drawn by error from a specimen of *C. tuberculata* var. *ehrenbergiana* (C. G. Pringle 4139).



Plate 67. CAREX PSILOCARPA

68. *Carex ballsii* Nelm. (391.1)

Carex ballsii Nelm., Kew Bull. 134. 1940.

Cespitose from stout rootstocks; *culms* stout, erect, about 12 dm. high, triquetrous with concave sides, scabrous above, surrounded at the base with leafless sheaths; *leaves* near the base, equaling the culms, 7–10 mm. wide, stiff, coriaceous, keeled, glaucous-green, the margins revolute and scabrous-serrulate, as is the midrib beneath, the sheaths thin-membranaceous, reddish-brown, at length fibrillose; *spikes* about 20, paired except for the upper 2 or 3, androgynous (staminate portion short), cylindrical, generally 3.5–8 cm. long, 5–8 mm. wide, densely flowered, often pendant, the lower subapproximate, equally long-peduncled, sometimes short-branched at the base, the upper approximate, unequally peduncled, the peduncles scabridulous; *lower bracts* foliaceous, exceeding the inflorescence, very short-sheathing, the upper smaller or scale-like; *pistillate scales* ovate-elliptic, dark-chestnut, weakly keeled, the apex usually muticous, the lowermost rarely awned, the midrib generally not reaching the apex; *perigynia* from slightly shorter than the scales (possibly due to the immaturity of the holotype) to slightly exceeding them, 3.5 mm. long, subinflated-trigonus above, compressed-trigonus below, oblong-elliptic, glabrous, minutely papillose or granular above, especially at the base of the beak, membranaceous, slightly oblique, at length somewhat spreading, nerveless, strongly stipitate, rather abruptly contracted into a short, very shallowly bidentulate beak obliquely cut at the orifice; *achene* oblong or oblong-obovoid, constricted in the middle, oblique.

Known only from the type collection: Loma-Grande, 9,700 ft., Mt. Orizaba, Veracruz, Mexico, *Balls & Gourlay B4371*, Apr. 27, 1938 (K).



Plate 68. CAREX BALLSII

69. *Carex chordalis* Liebm. (392)

Carex chordalis Liebm., Danske Vid. Selsk. Skr. V. 2: 269. 1850.

C. jamesonii var. *gracilis* Bailey, Bot. Gaz. 13: 88. 1888.

C. jamesonii var. *chordalis* (Liebm.) Kükenth. in Engler, Pflanzenreich 4 (20) : 409. 1909.

Cespitose; *culms* stout, stiff, erect, 6–12 dm. high, sharply triquetrous with concave sides, roughened above, phyllopodic, cinnamon-brown-tinged at the base; *leaves* with well-developed blades 6–10 to a fertile culm, near the base, the blades 3–6 dm. long, 5–10 mm. wide, keeled and channeled below, flat above with revolute margins, coriaceous, sparingly septate-nodulose, glaucous-green, roughened toward the attenuate apex, the sheaths thin, yellowish-brown-tinged and red-dotted ventrally, the ligule longer than wide; *spikes* 15–25, androgynous, 50–200-flowered, 5–15 cm. long, 5–7 mm. wide, the lower in twos, threes or fours, erect or drooping on long, slender, rough peduncles, the inflorescence 2–4 dm. long; *lower bracts* leaf-like, the upper reduced; *pistillate scales* rough-awned, dark-reddish-tinged with hyaline margins and three-nerved, green center; *perigynia* lanceolate, compressed-trigonal, 3–5 mm. long, 1 mm. wide, spreading-ascending, oblique, excurved, membranaceous, two-keeled, slenderly nerved, light- or yellowish-green, round-tapering at the base, substipitate, tapering into a smooth, hyaline-tipped, bidentate beak 1 mm. long, the teeth hispidulous within; *achenes* oblong-ellipsoid, trigonal with the sides convex above, closely enveloped, yellowish-brown, substipitate, apiculate, jointed with the flexuous style.

Frequent to locally common on wooded mountain slopes and in moist ravines, at 3,500 to 10,000 ft., from central Mexico (Jalisco, Hidalgo, State of Mexico, Federal District, Veracruz, Guerrero, Oaxaca, and Chiapas) to Guatemala and Costa Rica. Also in Colombia.



Plate 69. CAREX CHORDALIS

70. *Carex chiapensis* F. J. Herm. (392.1)

Carex chiapensis F. J. Herm., Brittonia 19: 68. 1967.

Perennial; *culms* 8–9 dm. high, phyllopodic, acutely triangular; much exceeding the leaves; *leaves* 11–14 to a fertile culm, mostly distichously clustered at the base of the culms, the sheaths short, glabrous (1–3 cm. long) and early ruptured, the ligule wider than long, the blades flat, stiff, dull-green, 2–3.5 dm. long, 5–7.5 mm. wide, scabridulous on the upper surface; *cauline leaves* 2–3; *inflorescence* 15–20 cm. long, except for one or two widely disjunct spikes in the lowermost bracts; *spikes* 7–9, androgynous (the apical one-eighth to one-half staminate), linear-cylindric, flexuous, ascending or drooping, 5–8 cm. long, 4–7 mm. wide, with 30–110 ascending-spreading perigynia, on unequal, long (0.5–7 cm.), capillary, more or less scabrous peduncles; *bracts* leaf-like, about equaling the inflorescence (the lowermost with a blade 25–30 cm. long), the sheaths prolonged (up to 8 cm.); scales oblong-lanceolate, obtuse (rarely acuminate) at the hyaline apex, 3.5–6 mm. long, little shorter than the perigynia, dull-purplish-red, the center reddish-brown; *perigynia* fusiform, trigonous, rather sharp-edged, not inflated, 4.5–6 mm. long, 1–1.25 mm. wide, straight or slightly excurved, membranaceous to subcoriaceous, glabrous, olive-green below shading to purplish-red above, slenderly nerved, tapering at the base, gradually tapering into a smooth, hyaline-tipped, obliquely cut and weakly bidentulate beak, 1.25–2 mm. long (one-half the length of the body or more); *achenes* trigonous, narrowly elliptic-obovoid, 2.75×1 mm., pale-brown, minutely papillose.

Known only from the type collection: steep slopes on S.E. side of Zontehuitz near summit, 9,400 ft., municipio of San Cristóbal las Casas ("Chamula"), Chiapas, Mexico, July 30, 1964, *D. E. Breedlove* 6714 (US; DS; F; Instituto Nacional de Investigaciones Forestales, México, D.F.).



Plate 70. CAREX CHIAPENSIS

71. *Carex cortesii* Liebm. (393)

Carex cortesii Liebm., Danske Vid. Selsk. Skr. V. 2: 268. 1850.

Cespitose from short, stout rootstocks; *culms* 6–12 dm. high, stout, triquetrous with concave sides, phyllopodic, dull-reddish-brown-tinged at the base, the basal sheaths filamentose; *leaves* with well-developed blades 7–15 to a fertile culm, the blades 3–6 dm. long, 3–6 mm. wide, stiff, flat above with revolute margins, keeled and channeled toward the base, sparingly septate-nodulose, coriaceous, glaucous-green, roughened toward the attenuate apex, the sheaths thin-hyaline and yellowish-brown-tinged and red-dotted ventrally, the ligule longer than wide; *spikes* 15–25, androgynous, 2.5–7 cm. long, 4–6 mm. wide, 30–100-flowered, drooping on long, slender, rough peduncles, the lower in pairs, forming an inflorescence 1–2 dm. long; *lower bracts* leaf-like, the upper reduced; *scales* rough-awned or cuspidate, dark-red with hyaline margins and three-nerved, greenish center; *perigynia* oblanceolate, compressed-trigonus, oblique, excurved, membranaceous, two-ribbed, light- or yellowish-green, red-dotted, substipitate, tapering into a smooth, hyaline-tipped, bidentate beak 1 mm. long, the short, erect teeth hispidulous within; *achenes* trigonus with the sides convex above, 2×0.75 mm., yellowish-brown, substipitate, jointed with the flexuous style.

Occasional to frequent on wooded mountains, especially along banks of streams at 4,000 to 12,200 ft., from central and southern Mexico (Jalisco, Hidalgo, State of Mexico, Puebla, Oaxaca, and Chiapas) to Guatemala and Costa Rica.



Plate 71. CAREX CORTESII

72. *Carex tojquianensis* Standl. & Steyererm. (393.1)

Carex tojquianensis Standl. & Steyererm., Ceiba 4: 64. 1953.

Loosely cespitose and substoloniferous, the stolons stout with dark-blackish-brown or reddish-black scales; *culms* 2.5–5.5 dm. high, 2–3 mm. thick below the middle, erect, triquetrous, glabrous, exceeding the leaves, the lower and basal sheaths not filamentose; *leaves* with well-developed blades 7–10 to a fertile culm, coriaceous, stiff, strongly keeled beneath and channeled above, somewhat revolute, 1–2.5 dm. long, 2.5–4 mm. wide, glabrous, long-attenuate, the sheaths dark-blackish-brown or reddish-brown at the base, striate; *spikes* 3–4, androgynous, usually single, spreading or drooping on unequal, elongated, slender, smooth peduncles mostly longer than the spikes, the spikes linear-oblong, 2–3.5 cm. long, 4–6 mm. wide, closely and densely flowered, the upper one-fourth or one-fifth staminate, the inflorescence 5–12 cm. long; *bracts* leaf-like short-sheathing (the sheath averaging 3 mm. long), 7–11 cm. long, 1–1.5 mm. wide; *scales* oblong-lanceolate, obtuse to subacute, dark-brownish-red with prominently nerved pale-green center and very narrow hyaline margins, about the same width or slightly narrower than and about equaling the length or slightly exceeding the perigynia, 3–3.25 (–5) mm. long, 1.25–1.5 mm. wide; *perigynia* elliptic-oblong or elliptic-lanceolate, compressed-trigonus, not inflated, 3–3.5 mm. long, 1.25–1.5 mm. wide, appressed-ascending, stramineous or greenish-buff throughout or the lower half reddish-brown-dotted, two-keeled, several-nerved on one or more sides at maturity (sometimes toward the base only), otherwise nerveless, narrowed at the substipitate base, glabrous or minutely hispidulous on the margins above, tapering into the oblique, subentire beak, 0.3–0.6 mm. long; *achenes* elliptic-oblong, trigonus, 2.25–2.5 × 1.25 mm., nearly filling the perigynium-body, apiculate, jointed with the slender style.

Known only from the summit of Sierra de los Cuchumatanes, 12,140 ft., between Tojquia and Caxin bluff, Dept. of Huehuetenango, Guatemala, *M. Roe* 648, July 30, 1965 (F). (*Steyermark* 50175, cited as this species in the original description, is *C. caxinensis* F. J. Herm., of Section Viridiflorae).

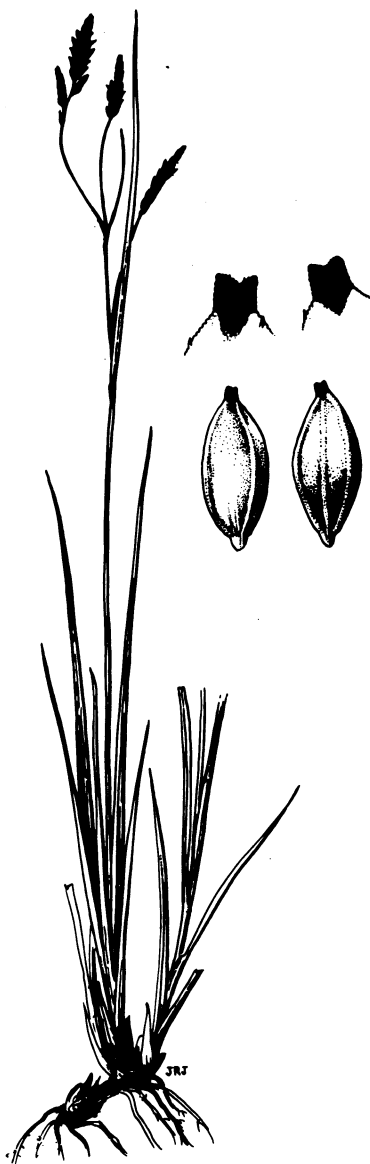


Plate 72. CAREX TOJQUIANENSIS

73. *Carex melanosperma* Liebm. (394)

Carex melanosperma Liebm., Danske Vid. Selsk. Skr. V. 2: 269. 1850.

C. jamesonii var. *melanosperma* (Liebm). Kükenth. in Engler, Pflanzenreich 4(20): 409. 1909.

Cespitose from short, stout rootstocks; *culms* 6–12 dm. high, stout, phyllopodic, triquetrous with concave sides, reddish-brown-tinged at the base, the lower sheaths filamentose; *leaves* with well-developed blades 7–15 to a fertile culm, 3–6 dm. long, 4–8 mm. wide, flat above, keeled and channeled toward the base, stiff, coriaceous, sparingly septate-nodulose, glaucous-green, roughened toward the attenuate apex, the margins revolute, the sheaths thin-hyaline and yellowish-brown-tinged and red-dotted ventrally, the ligule longer than wide; *spikes* 15–25, androgynous, 2.5–7 cm. long, 4–6 mm. wide, 30–100-flowered, drooping on slender, rough peduncles, the lower in twos, threes or fours, the inflorescence 1–2 dm. long; *lower bracts* leaf-like, the upper reduced; *scales* rough-awned or cuspidate, reddish-brown with hyaline margins and three-nerved, greenish center; *perigynia* trigonous, elliptic-ovoid, somewhat flattened, oblique, excurved, membranaceous, dull- or yellowish-green, red-dotted, two-ribbed, strongly nerved, the bidentate beak 0.5 mm. long, hyaline-tipped; *achenes* trigonous with the sides convex above, 1.75×1 mm., closely enveloped, reddish-black, lustrous, puncticulate, substipitate, short-apiculate, jointed with the slender style.

Rare or infrequent along brooks and edges of wet forests, at 8,000 to 10,000 ft., in Puebla and Morelos, Mexico, and the Sierra Madre Mts., Dept. of Sololá, Guatemala.



Plate 73. CAREX MELANOSPERMA

74. *Carex donnell-smithii* Bailey (395)

Carex donnell-smithii Bailey, Mem. Torrey Bot. Club 1: 56. 1889.

C. pittierii Böck., Allg. Bot. Zeits. 2: 190. 1896.

C. jovis C. B. Clarke, Contr. U. S. Natl. Herb. 10: 470. 1908.

Cespitose; *culms* 3–10 dm. high, stout, triquetrous with concave sides, roughened above, phyllopodic, dark-red-tinged at the base, the lower sheaths filamentose; *leaves* with well-developed blades 7–15 to a fertile culm, the blades 3–6 dm. long, 3–10 mm. wide, flat with revolute margins, keeled and channeled toward the base, stiff, coriaceous, glaucous-green, roughened toward the attenuate apex, the sheaths thin, hyaline and red-dotted ventrally, the ligule longer than wide; *spikes* numerous, androgynous, 3–12 cm. long, 3.5–5 mm. wide, 20–50-flowered, in a compound inflorescence 2–6 dm. long, the lower branches in twos, threes or fours, drooping on rough, filiform peduncles; *lower bracts* leaf-like, the upper reduced; *scales* dark-reddish-black with hyaline upper margins and apex and one- three-nerved lighter center, the awn short (or absent), smooth or weakly hispid; *perigynia* lanceolate, compressed-trigonous, 3.5–4.5 mm. long, oblique, often bent in the middle, membranaceous, dull-green and often reddish-black-tinged, punctulate, two-ribbed, smooth to faintly nerved, short-stipitate, the beak 1–1.5 mm. long, weakly recurved or merely oblique, roughish, reddish-black-tinged, strongly bidentate, not, or only very shallowly, obliquely cut, the teeth rather stiff, scabrous within; *achenes* 2–2.5 × 1–1.25 mm., trigonous with the sides convex above, not constricted in the middle, closely enveloped, dark-reddish-black, lustrous, substipitate, apiculate, jointed with the flexuous style.

Rare in central Mexico (Michoacan), frequent to common in Chiapas, Guatemala, Honduras, and Costa Rica on mountain slopes at 5,500 to 13,000 ft.



Plate 74. CAREX DONNELL-SMITHII

75. *Carex jamesonii* Boott (395.1)

Carex jamesonii Boott, Proc. Linn. Soc. 1: 258. 1845.

Cespitose; *culms* stout, 6–12 dm. high, triquetrous, the sides concave, the sharp angles scabrous, leafy below; *leaves* equaling the culms, the blades 6–10 mm. wide, flat with revolute margins, prominently two-nerved, keeled, glaucous, coriaceous, the sheaths thin-membranaceous, cinnamon-colored or brownish-red and filamentose at the base, the lowermost leafless and keeled; *spikes* numerous (20–30), androgynous, the upper one-fourth to one-third staminate, cylindrical, densely flowered, 3–5 cm. long, simple or the lower ones few-branched and pendulous, the upper subsessile, approximate, the intermediate 2–4 times branched, unequally long-peduncled, the lowermost generally separate, single and very long-peduncled, the peduncles scabrous; *lowest bract* short-sheathing, equaling the inflorescence, the intermediate foliaceous, sheathless, the upper setaceous; *scales* lanceolate, almost equaling the perigynia, brown or dark-red with narrow hyaline margins and three-nerved, straw-colored center, tipped with a long, strongly hispid awn; *perigynia* compressed-trigonus, 2.8–3(4) mm. long, lanceolate or oval, at length somewhat spreading or excurved, membranaceous, olivaceous, glabrous or somewhat scabrous toward the apex, lustrous, at length dark-red-tinged, conspicuously several-nerved, stipitate, rather abruptly tapering into the dark-reddish, usually rather shallowly bidentate beak, which is obliquely cut dorsally and usually abruptly excurved almost at a right angle; *achenes* trigonus, oblong, $1.25-2 \times 0.75-1$ mm., constricted in the middle.

Common to very common on steep, moist, often densely wooded slopes at 3,300 to 12,000 ft., in Chiapas, Guatemala, Honduras, Costa Rica, and Panama. Also in northern South America.

The constricted achenes and other characteristics separating this species from *C. donnell-smithii* were overlooked by Mackenzie, who supposed *C. jamesonii* to be restricted to South America; consequently many of the collections referred by him to *C. donnell-smithii* are actually *C. jamesonii*.



Plate 75. CAREX JAMESONII

76. *Carex lemanniana* Boott (396)

Carex lemanniana Boott, Trans. Linn. Soc. 20: 121. 1846.

C. lemanniana var. *simplex* Kükenth. in Engler, Pflanzenreich 4(20): 405. 1909.

Cespitose and stoloniferous from stout, woody rootstocks, the stolons ascending; *culms* 2.5–6 dm. high, stiff, triquetrous with concave sides, roughened above, phyllopodic, dull-brownish at the base; *leaves* with well-developed blades 7–15 to a fertile culm, the blades 1–4 dm. long, 2.5–8 mm. wide, channeled above, keeled below, with revolute margins, coriaceous, roughened toward the attenuate apex, the sheaths thin, yellowish-brown-tinged and red-dotted ventrally, concave at the mouth, the ligule wider than long; *spikes* 4–20, androgynous, 20–40-flowered, 2–8 cm. long, 3.5–5 mm. wide, the lower often compound, drooping on slender peduncles, forming an inflorescence 1–2.5 dm. long; *lower bracts* leaf-like, the upper reduced; *scales* rough-awned to cuspidate, dark-reddish-black with hyaline upper margins and apex and one- three-nerved lighter center; *perigynia* oblong-obovate, plano-convex 2.5 mm. long, 1 mm. wide, ascending, membranaceous, straw-colored and reddish-spotted or -streaked, puncticulate, striate ventrally, nerved dorsally, two-ribbed, hispid-serrulate above, stipitate, the beak 0.5 mm. long, bidentate, reddish-tinged above, the orifice hyaline, the teeth scabrous within; *achenes* 1.75 × 0.85 mm., lenticular, closely enveloped, brown, dull, short-spiculate, jointed with the short style; *stigmas* 2.

Common in montane meadows (where it often forms dense tussocks) at 8,000 to 13,000 ft., in Costa Rica and Panama. Also in Colombia and Ecuador.



Plate 76. CAREX LEMMANIANA

26. § ATRATAE

77. *Carex bella* Bailey (429)

Carex bella Bailey, Bot. Gaz. 17: 152. 1892.

C. atrata var. *discolor* Bailey, Jour. Bot. 26: 321. 1888.

Cespitose from short-creeping, fibrillose rootstocks; *culms* very slender, 5–9 dm. high, much exceeding the leaves, phyllopodic, cinnamon-brown and more or less strongly red-tinged at the base, the dried leaves of the previous year conspicuous; *leaves* usually 8–12 to a culm, scattered on the lower half, erect, flat, 3–6 mm. wide, long-attenuate, the sheaths ventrally dull-reddish-brown-tinged or dotted, the ligule as wide as long; *spikes* 3 or 4, the lower more or less drooping on slender, roughish peduncles 1.5–4 cm. long, the upper spikes erect, short-peduncled or subsessile, the uppermost contiguous, the others more or less strongly separate, gynaeandrous, the terminal spike half staminate, the lateral with only a few staminate flowers, linear to oblong-linear, 12–25 mm. long, 4–5.5 mm. wide, closely 15–30-flowered, the perigynia appressed, the terminal spike slightly wider; *lowest bract* short (2.5 mm. long), leaflike, sheathing, exceeding the head; *upper bracts* much reduced; *pistillate scales* ovate, obtuse to acute, dark-reddish-brown with lighter midrib usually conspicuous to the tip and shining white-hyaline margins, nearly as wide as, but shorter than, the mature perigynia; *perigynia* strongly flattened but swollen by the ripening achene, broadly oval to oblong-oval, 3–4 mm. long, 1.75–2 mm. wide, nerveless (except for the two marginal ribs) or lightly two- to three-nerved, whitish-green, little or not at all red-tinged, membranaceous, smooth, punctulate, rounded at the base, substipitate, rounded at the apex and abruptly beaked, the beak 0.3 mm. long, apiculate, shallowly bidentate; *achenes* obovoid or oblong-obovoid, $2\text{--}2.25 \times 1.75$ mm., trigonous, yellowish-brown, granular, substipitate, strongly apiculate.

Known in our area from a single collection from Mexico: moist meadow openings in pine forest near peak of Cerro Potosí, 11,900 ft., Municipio de Galeana, Nuevo Leon, R. A. Schneider 960, July 27, 1938 (F; GH; MICH). South Dakota and Colorado to Utah, southward to New Mexico, Arizona, and Nuevo Leon.



Plate 77. CAREX BELLA

27. § ACUTAE

78. *Carex emoryi* Dewey (464)

Carex emoryi Dewey in Torr., Bot. Mex. Bound. Surv. 230. 1859.

C. virginiana var. *elongata* Böck., Linnaea 40: 432. 1876.

C. stricta var. *emoryi* Bailey, Proc. Am. Acad. 22: 85. 1886.

C. stricta var. *elongata* (Böck.) Gleason, Phytologia 4: 22. 1952.

Loosely cespitose, with long scaly, rather stout, horizontal rhizomes; *culms* 4–10 dm. high, erect, stout (about 6–8 mm. thick at the base), but slender above, exceeding the leaves, strongly aphyllopodic, reddish-tinged at the base; *leaves* 3 or 4 to a culm, somewhat nodulose, papillate, 3–5 mm. wide, flat with slightly revolute margins, long-attenuate, the lower sheaths strongly septate-nodulose, not becoming filamentose, the ligule much wider than long; *terminal spikes* staminate, strongly peduncled, linear, 2–4.5 cm. long, 4 mm. wide; *lateral spikes* 4–6, the upper one or two staminate, the lower pistillate or androgynous, erect, sessile or the lower short-peduncled, linear, 2–10 cm. long, 4–6 mm. wide, densely 50–200-flowered, the perigynia appressed-ascending; *lowest bract* leaflike, more or less equaling the culm, sheathless, the upper much reduced; *scales* lanceolate, from obtuse to acuminate, narrower than the perigynia (scarcely 1 mm wide) and from slightly shorter to much exceeding them, light-brown to reddish-brown with a broad lighter three-nerved center; *perigynia* unequally biconvex, 2.25–2.75 mm. long, 1.5–1.75 mm. wide, broadly ovate to obvate, light-green to straw-colored, punctulate and somewhat red-dotted, two-ribbed (the marginal), nerveless or nearly so ventrally, few-nerved dorsally, rounded at the nearly sessile base, abruptly apiculate-beaked (the beak 0.2 mm. long), the minutely emarginate or entire orifice whitish; *achenes* lenticular, oblong-quadrate, 1.5 × 1 mm., abruptly minutely apiculate.

Known in our area from a single collection from Mexico: Múzguiz, eastern Coahuila, *E. G. March* 1081, Dec. 5, 1936 (distributed as *C. stricta* Lam.) (F; GH). In swampy meadows or springy places, or on wet banks or in ditches, from New Jersey to Virginia, westward to central Colorado, Texas, New Mexico, and Coahuila.



Plate 78. CAREX EMORYI

79. *Carex endlichii* Kükenth. (470)

Carex endlichii Kükenth., Repert. Sp. Nov. 8: 291. 1910.

Loosely cespitose, with stout, scaly, brownish, horizontal and ascending stolons; *culms* slender (4–5 mm. thick at the base), 4–6 dm. high, with concave sides, papillose, rough above, aphyllopodic, reddish-brown-tinged at the base, the basal sheaths keeled, filamentose; *sterile shoots* long, less strongly aphyllopodic; *leaves* with well-developed blades 3–5 to a fertile culm, on the lower third, the blades 1–3 dm. long, 2.5–3.5 mm. wide, stiff, rather thick, channeled above, obscurely septate-nodulose, light- or glaucous-green, rough on the revolute margins and toward the attenuate apex, the sheaths white-hyaline and often red-dotted ventrally, concave at the mouth, the ligule as long as wide; *terminal spike* staminate, 25–35 mm. long, 3–4.5 mm. wide; *lateral spikes* 2–3, pistillate, 30–100-flowered, 1.5–3 cm. long, 4–5 mm. wide; *bracts* sheathless, the lowest leaf-like, reddish-black-tinged and biauriculate at the base, the upper reduced; *scales* obtuse, reddish-black with one- three-nerved lighter center and hyaline apex; *perigynia* obovate-orbicular, plano-convex, 2.5 mm. long, 1.75 mm. wide, membranaceous, yellowish-green or straw-colored, resinous, punctulate, granular, two-ribbed, few-nerved, short-stipitate, the beak 0.5 mm. long, bidentulate, dark-tipped; *achenes* lenticular, 1.75 × 1.25 mm., closely enveloped, dark-brown, granular, minutely apiculate, jointed with the short style.

Occasional in swampy habitats at 7,000 to 13,000 ft., in Chihuahua, Michoacan, State of Mexico, and Guatemala.

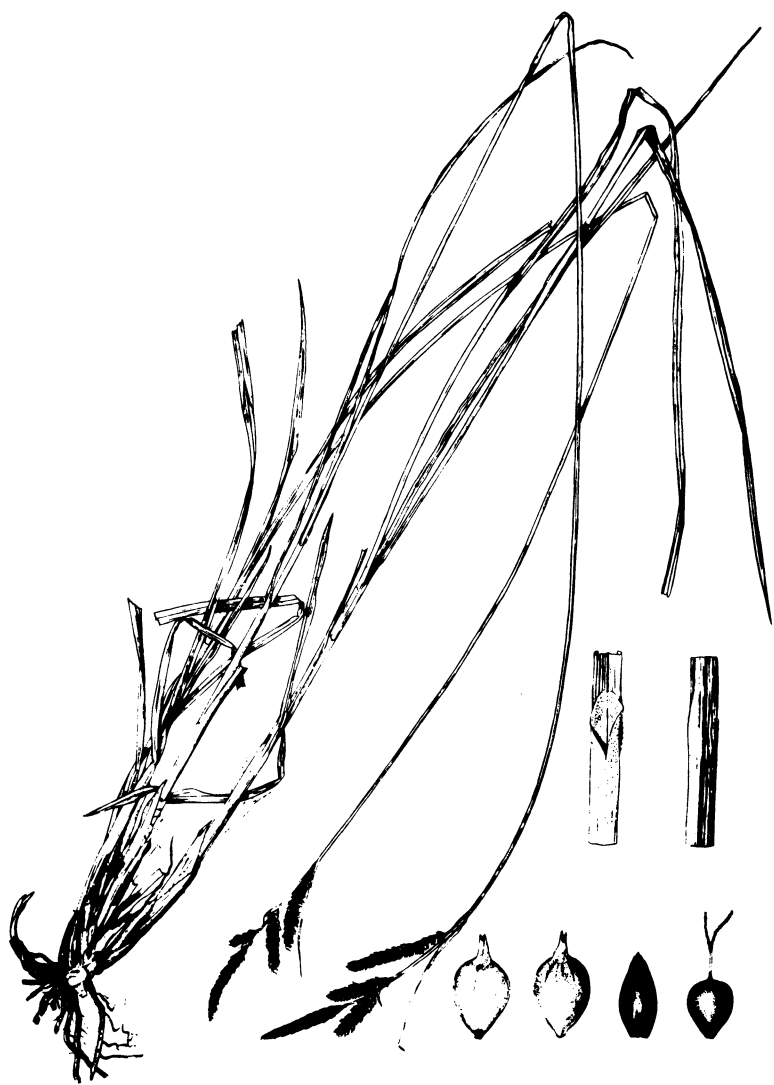


Plate 79. CAREX ENDLICHII

80. *Carex eurycarpa* Holm (471)

Carex eurycarpa Holm, Am. Jour. Sci. IV. 20: 303. 1905.

C. oxycarpa Holm, Am. Jour. Sci. IV. 20: 303. 1905.

C. eurycarpa var. *oxycarpa* (Holm) Kükenth. in Engler, Pflanzenreich 4 (20) : 339. 1909.

Loosely cespitose from short-creeping rootstocks, the rhizomes stout, scaly; *culms* 4–9 dm. high, 4–5 mm. thick at the base, slender, exceeding the leaves, strongly reddish-tinged at the base, aphyllopodic; *leaves* 3 or 4 to a culm, somewhat aggregated on the lower fourth, flat with revolute margins papillate, 2–3 mm. wide, the sheaths hispidulous dorsally, the lower breaking and becoming filamentose, the ligule as wide as long; *terminal spike* staminate, linear, peduncled, 3–4 cm. long, 5 mm. wide; *lateral spikes* 4 or 5, the upper 1 or 2 small, staminate, the lower 2–4 pistillate or androgynous, more or less strongly separate, sessile or short-peduncled, erect, 2.5–4.5 cm. long, 5 mm. wide, densely 50–150-flowered, the perigynia appressed-ascending; *lowest bract* leaflike, exceeding the inflorescence, sheathless, the upper bracts reduced; *scales* lanceolate, acute or cuspidate, reddish-black with whitish midrib, narrower than the perigynia; *perigynia* unequally biconvex, obovate to suborbicular-obovate, 3 mm. long, 1.5–2 mm. wide, two-ribbed (the marginal) and finely 3–7-striate on both surfaces, brownish, puncticulate, granular-roughened, resinous-dotted, the margins sharp-nerved, often with a few stiff, deciduous cilia, rounded at the substipitate base, rounded and abruptly apiculate at the apex, the beak 0.2–0.5 mm. long, entire or slightly emarginate; *achenes* lenticular, obovate, 1.5 × 1.25 mm., brownish, substipitate, apiculate.

In our area known from a single collection: La Grulla Creek Canyon, 1½ mi. below the flats, 6,700 ft., Sierra San Pedro Martin, Baja California, *I. L. Wiggins 9061*, Sept. 21, 1938 (US) (distributed as *C. senta* Boott). Washington to Baja California, eastward to Idaho and western Montana.



Plate 80. CAREX EURYCARPA

28. § HISPIDAE

81. *Carex spissa* Bailey (482)

Carex spissa Bailey, Proc. Am. Acad. 22: 70. 1886.

Loosely cespitose from very stout, elongate rootstocks; *culms* stiff, very tall and stout, 1–2 m. high, 2 cm. thick at the base, phyllopodic, dark-brownish at the base, much exceeding the leaves, very smooth on the angles; *leaves* 5–10 to a culm, clustered above the base, the blades not septate-nodulose, coriaceous, 7–15 mm. wide, flat above with revolute margins, strongly keeled, strongly serrulate on the margins, the sheaths deeply concave at the mouth, breaking and becoming conspicuously filamentose, the ligule longer than wide; *staminate spikes* 3 or 4, approximate, sessile or the upper short-peduncled, 4–10 cm. long, 5 mm. wide; *anthers* conspicuous, 4 mm. long; *pistillate spikes* 3–7, approximate or the lower one or two more or less separate, erect, sessile or very short-peduncled (the lowest occasionally longer-peduncled), linear-cylindric, 6–14 cm. long, 7–10 mm. wide, staminate at the apex, densely 150–300-flowered, the perigynia ascending to squarrose-spreading; *bracts* leaflike, the lowest little-sheathing, exceeding the inflorescence; *scales* lanceolate or ovate-lanceolate, three-nerved, tapering or rather abruptly contracted into a rough, serrulate awn, exceeding but narrower than the perigynia, straw-colored or brownish with a broad green or light-colored center and hyaline margins; *perigynia* broadly obovoid, membranaceous, becoming inflated, obscurely trigonous, 3–4.5 mm. long, 1.5 mm. thick, straw-colored and more or less glaucous, red-striate-dotted, smooth, obscurely few-nerved, round-tapering at the sessile base, rounded and very abruptly short-beaked at the apex, the beak 0.5 mm. long, often bent, the orifice emarginate; *achenes* trigonous, elliptic-obovoid, 2–2.5 × 1 mm., dark-colored, substipitate, continuous with the slender, very abruptly bent style.

Infrequent to rare along streams from near sea level to 7,000 ft., in Baja California, including the Revillagigedo Islands, and Puebla, Mexico. Arizona (?), southern California, and Mexico.



Plate 81. CAREX SPISSA

81a. *Carex spissa* var. *ultra* (Bailey) Kükenth. (483)

Carex ultra Bailey, Proc. Am. Acad. 22: 83. 1886.

C. spissa var. *ultra* (Bailey) Kükenth. in Engler, Pflanzenreich 4(20): 422. 1909.

Differs from the typical form in having the perigynia usually appressed-ascending, rather than squarrose-spreading, little or not at all inflated, and the style usually straight rather than abruptly bent.

Infrequent to rare in springy places in canyons, up to 9,500 ft., in Sonora, Coahuila, and Puebla, Mexico. Also in southern Arizona and New Mexico.



Plate 81a. CAREX SPISSA VAR. ULTRA

81b. *Carex spissa* var. *seatoniana* (Bailey) Kükenth. (484)

Carex seatoniana Bailey, Bot. Gaz. 25: 270. 1898.

C. spissa var. *seatoniana* (Bailey) Kükenth. in Engler, Pflanzenreich 4 (20) : 422, 1909.

Differs from the typical form in having the usually appressed-ascending perigynia setose-scabrous toward the apex, not or little inflated, and the achenes narrowly oblong-obovoid. It differs from var. *ultra* in its acuminate, usually long-aristate, rather than acute to moderately short-awned scales, and in its usually abruptly bent style. Intermediates between all three varieties are more frequent than the typical extremes.

Infrequent in springy habitats at 5,200 to 7,300 ft., in central Mexico (Hidalgo, Puebla, Oaxaca).

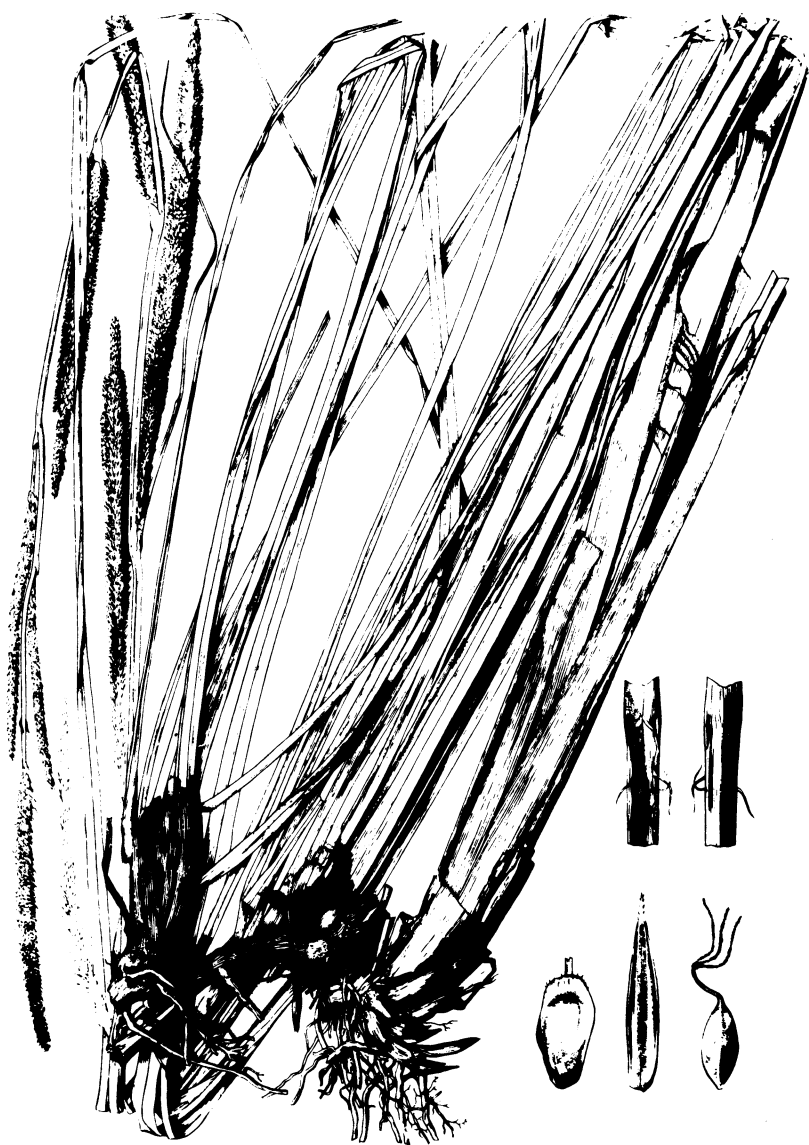


Plate 81b. CAREX SPISSA VAR. SEATONIANA

82. *Carex pringlei* Bailey (485)

Carex pringlei Bailey, Bot. Gaz. 17: 151. 1892.

Loosely caespitose from long, stout rootstocks, sending forth stout, scaly, horizontal stolons; *culms* stiff, very stout, 1–2 m. high, nearly 2 cm. thick at the blackish base, 5–6 mm. wide above, phyllopodic, triquetrous with flat sides and smooth angles, much exceeding the leaves; *leaves* with well-developed blades 5–10 to a fertile culm, the blades 4–6 dm. long, 6–12 mm. wide, coriaceous, flat with revolute margins, carinate, glaucous, serrulate on the margins and midrib beneath, attenuate, the sheaths dark-tinged and concave at the mouth, filamentose, the ligule longer than wide; *terminal spike* staminate, 7–9 cm. \times 6–7 mm. with a smaller one at the base; *lateral spikes* 5–7, pistillate or androgynous, 5–10 cm. \times 8–12 mm., erect, sessile or short-peduncled, containing one to several hundred perigynia; *bracts* leaf-like, the lowest long-sheathing and brown to blackish at the base; *pistillate scales* rough-cuspidate or awned, ciliate, strongly nerved, green with brownish hyaline margins; *perigynia* elliptic-lanceolate, strongly flattened, 7–8 mm. long, 1.5–2 mm. wide, appressed, membranaceous, greenish-straw-colored and red-dotted, hispid, scabrous above, especially on the nerves, tapering at the apex, the beak little differentiated, 1 mm. long, the orifice white, emarginate; *achenes* 2.5 \times 1 mm., trigonous, loosely enveloped, granular, long-stipitate, continuous with the long style.

Endemic to Mexico. Rare on stream banks, lake borders and in salt marshes in Coahuila and San Luis Potosí.

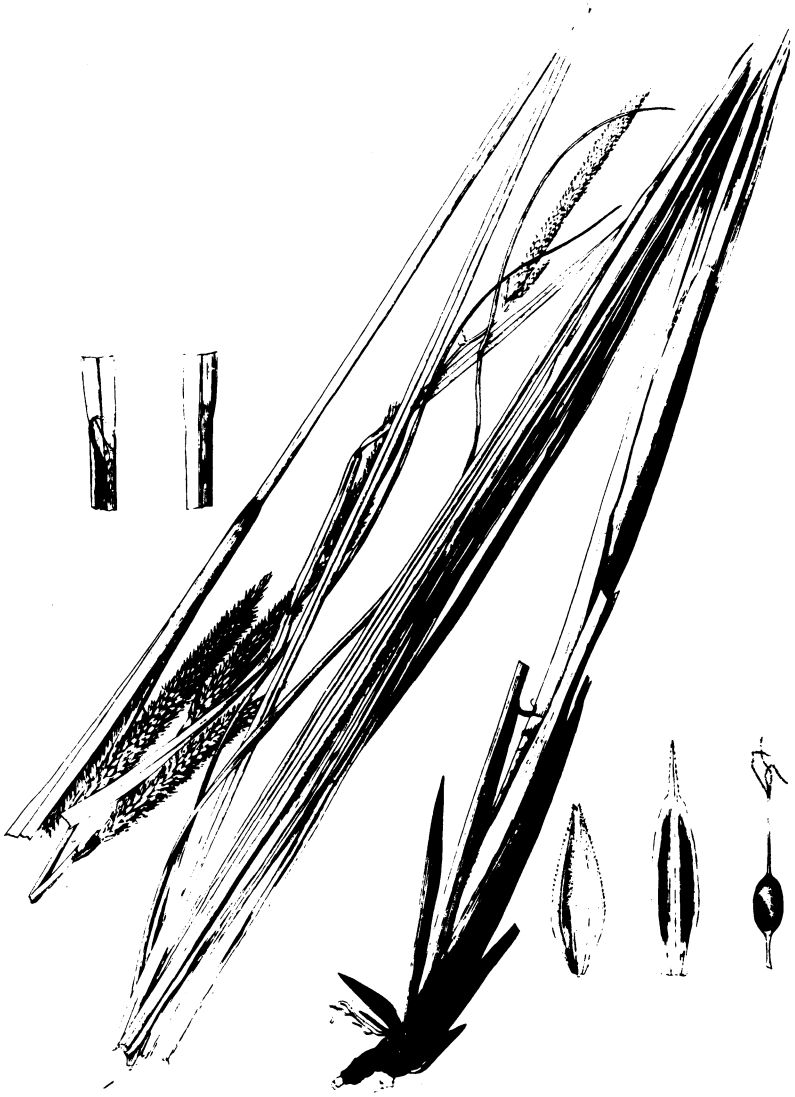


Plate 82. CAREX PRINGLEI

29. § PSEUDOCYPHEREAE

83. *Carex hystricina* Muhl. (493)

Carex hystricina Muhl. in Willd., Sp. Pl. 4: 282. 1805.

Cespitose from short, stout rootstocks, with long, very slender, horizontal rhizomes; *culms* 1.5–10 dm. high, slender, exceeded by the bracts and often by the upper leaves, sharply triangular and often roughened above, the lateral reddish-tinged at the base, the basal sheaths breaking and becoming more or less filamentose; *leaves* 3–7 to a culm, septate-nodulose, not clustered, thin, flaccid, flat with slightly revolute margins, 2–10 mm. wide, the sheaths concave at the mouth, the ligule as wide as, or wider than, long; *staminate spike* solitary, slender-peduncled, usually with a conspicuous bract some distance below, linear, 1–5 cm. long, 2.5–4 mm. wide; *pistillate spikes* 1–4, approximate or strongly separate, the lower nodding on long, rough peduncles, the upper erect on short peduncles, the spikes oblong or oblong-cylindric, 1–6 cm. long, 10–15 mm. wide, densely flowered, the numerous perigynia spreading; *bracts* leaflike, the lowest from little to strongly sheathing, the upper somewhat reduced; *scales* with small obovate or obanceolate bodies, ciliate-serrulate above, light-reddish-brown with three-nerved green center excurrent as a long, rough awn, the bodies much narrower and several times shorter than the perigynia; *perigynia* narrowly ovoid, 5–7 mm. long, 1.5–2 mm. wide, suborbicular in cross-section, inflated, membranaceous, glabrous, shining, light-green or greenish-straw-colored at maturity, closely many-ribbed, rounded at the short-stipitate base, tapering into a smooth, deeply bidentate, slender beak about 2 mm. long, the slender teeth erect, rigid, 0.5 mm. long; *achenes* small, obovoid, 1.75×1 mm., trigonous, the blunt angles thickened, granular, brownish, subsessile, abruptly contracted above and continuous with the slender style.

Known only from Coahuila and Veracruz (at 4,000 ft. alt.), Mexico in our area, where it is rare in swamps and on stream-banks. Quebec to Washington, southward to Virginia, Kentucky, Texas, Mexico, and California.



Plate 83. CAREX HYSTRICINA

84. *Carex thurberi* Dewey (494)

Carex thurberi Dewey in Torr., Bot. Mex. Bound. Surv. 232, 1859.

Cespitose from stout rootstocks; *culms* 6–12 dm. high, phyllopodic, erect, stout, shorter than the leaves and bracts, sharply triangular, reddish-tinged at the base, the lower sheaths breaking and becoming filamentose; *leaves* 5–10 to a culm, obscurely septate-nodulose, the blades flat with revolute margins, thin but rather stiff, 4–8 mm. wide, long-attenuate, very rough toward the apex, the sheaths sparsely hispidulous dorsally, concave and short-hispid at the mouth, the short ligule much wider than long; *terminal spike* staminate, erect, short-peduncled, linear, 4–8 cm. long, 3–5 mm. wide; *pistillate spikes* 3 or 4, approximate or more or less separate, drooping or the upper weakly erect on rough, slender peduncles mostly shorter (except the lowest) than the spikes, the spikes oblong-cylindric or cylindric, 3.5–7 cm. long, 8–10 mm. wide, densely 50–100-flowered, the perigynia ascending or spreading-ascending; *bracts* leaflike, sheathless or very nearly so, much exceeding the inflorescence; *scales* ovate, often emarginate, strongly rough-awned, the body large, ciliate-serrulate above, hyaline and slightly reddish-brown-tinged, the green center three-nerved, nearly as wide as but much shorter than the perigynia; *perigynia* elliptic-ovoid, 4–5 mm. long, 1.5 mm. wide, slightly inflated, suborbicular to obscurely triangular in cross-section, submembranaceous, punctulate, yellowish-green, finely several-ribbed, rounded at the short-stipitate base, tapering into a smooth, strongly bidentate beak 1.5 mm. long, the slender, stiff teeth slightly spreading, 0.5–0.75 mm. long; *achenes* oblong-obovoid, 1.75×0.75 mm., trigonous with blunt angles, substipitate, continuous with the slender, abruptly bent, persistent style.

Occasional in swamps and on seepy slopes in Mexico (Chihuahua, Jalisco, Veracruz and Chiapas) and Guatemala (Alta Vera Paz and Huehuetenango), at 4,000 to 9,000 ft. Arizona to Guatemala; Santo Domingo.

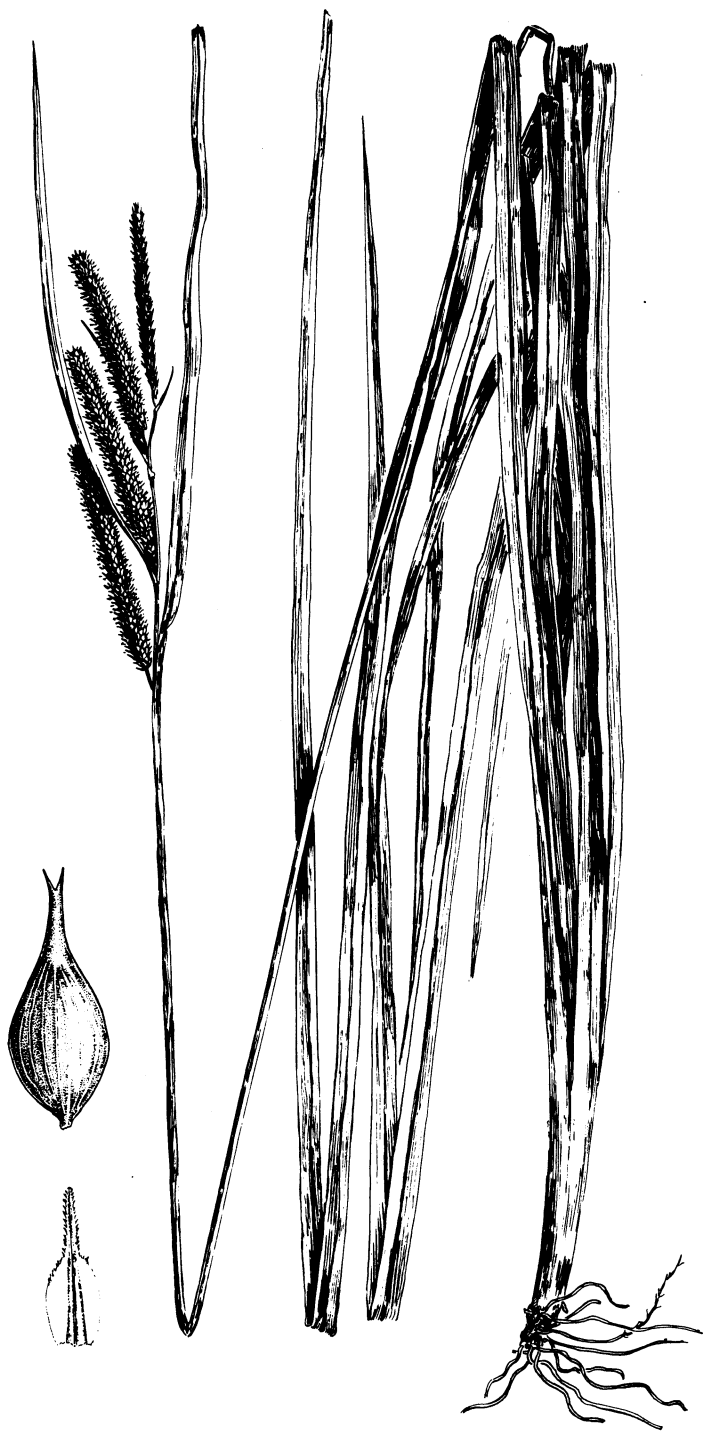


Plate 84. CAREX THURBERI

85. *Carex comosa* Boott (495)

Carex comosa Boott, Trans. Linn. Soc. 20: 117. 1846.

Cespitose from short, stout rootstocks; *culms* stout, 5–15 dm. high, winged-triquetrous, smooth or roughened above, phyllopodic, the old leaves persistent and conspicuous; *leaves* with well-developed blades 5–10 to a fertile culm, the blades 2–3 dm. \times 6–16 mm., flat with revolute margins, firm, strongly septate-nodulose, pale- or yellowish-green, roughened toward the attenuate apex, the sheaths thin and hyaline ventrally, yellowish-tinged, concave at the mouth, the ligule longer than wide; *terminal spike* staminate, 3–7 cm. \times 4–7 mm.; *lateral spikes* 3–6, pistillate, 15–75 \times 12–17 mm., the lower nodding on slender, rough peduncles, very densely flowered, containing very numerous, reflexed perigynia in many rows; *lower bracts* leaflike, little sheathing, the upper reduced; *pistillate scales* rough-awned, ciliate-serrulate, reddish-brown with three-nerved greenish- or straw-colored center; *perigynia* lanceolate, flattened-trigonal, 5–7 mm. long, 1.5 mm. wide, reflexed, coriaceous, light- or yellowish-green, glossy, puncticulate, strongly ribbed, obliquely stipitate, tapering into a smooth, very deeply bidentate beak 1.5–2 mm. long, the teeth stiff, recurved-spreading, 1.25–2 mm. long; *achenes* trigonal with blunt angles, 1.75 \times 0.75 mm., brownish, granular, continuous with the persistent style.

Known in our area from a single collection: abundant on boggy margins of Lake Atexca, below Molango, 4,600 ft., Hidalgo, Mexico, *H. E. Moore* 2936, May 27, 1947 (GH).

Quebec to Minnesota, southward to Florida and Texas; locally in Mexico and on the Pacific Coast from San Francisco to Washington, eastward to Idaho.

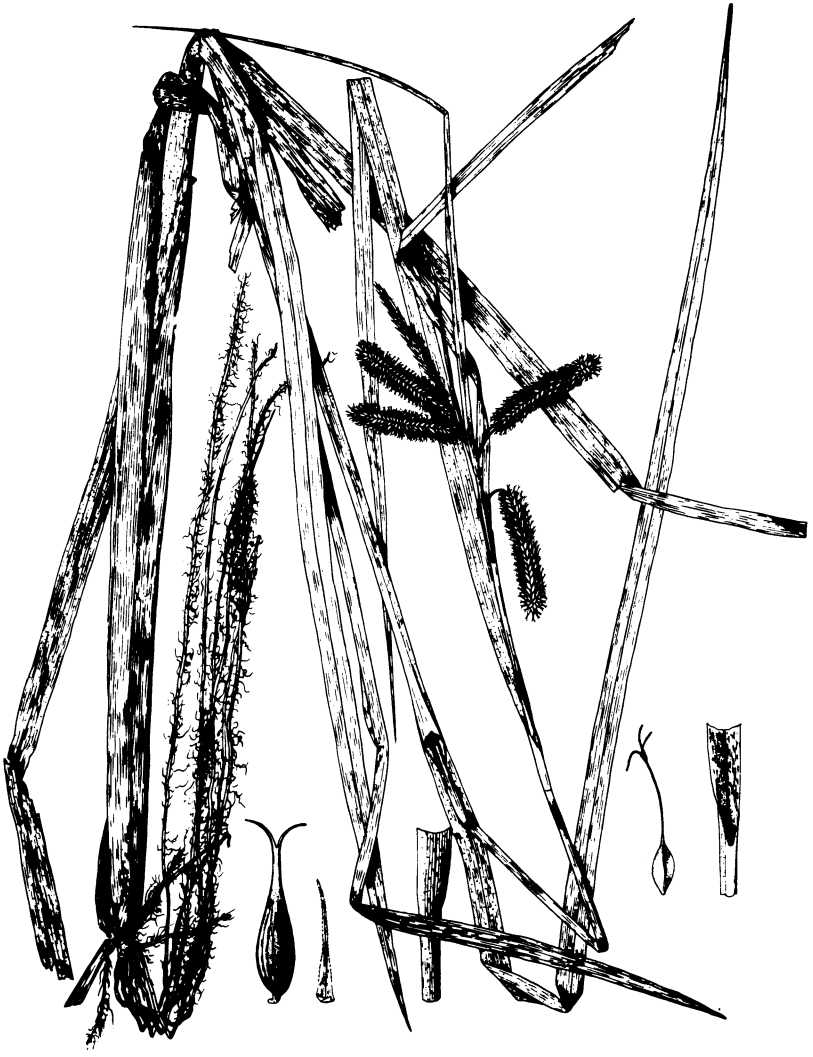


Plate 85. CAREX COMOSA

86. *Carex polysticha* Böck. (497)

Carex polysticha Böck., Viddensk. Meddel. 1869: 157. 1869.

C. pseudo-cyperus var. *polysticha* (Böck.) Kükenth., Verh. Bot. Prov. Brand. 47: 210, 1905.

Densely caespitose from short, stout rootstocks; *culms* stout, 6–12 dm. high, triquetrous with flat or concave sides, rough above, phyllopodic, red-tinged at the base, the basal sheaths filamentose; *leaves* with well-developed blades 7–15 to a fertile culm, the blades 3–6 dm. long, 8–18 mm. wide, flat above with revolute margins, channeled toward the base, firm, strongly septate-nodulose, pale-green, roughened toward the apex, the sheaths thin and white-hyaline ventrally, concave at the mouth, the ligule longer than wide; *terminal spike* staminate, 2–3 cm. \times 3–5 mm.; *lateral spikes* 3–6, pistillate, 50–150-flowered, 3–4 cm. \times 8–12 mm., erect, spreading or drooping on short, rough peduncles; *bracts* sheathless or nearly so, the lower leaf-like; *pistillate scales* rough-awned, ciliate-serrulate, hyaline with three-nerved green center; *perigynia* ovate-lanceolate, flattened-trigonous, 4.5 mm. long, 2 mm. wide, ascending or spreading, coriaceous, olive- or brownish-green, puncticulate, strongly ribbed, short-stipitate, tapering into a smooth beak with body 1 mm. long, the slender teeth erect, stiff, 1 mm. long; *achenes* trigonous with blunt angles, closely enveloped, brownish, granular, continuous with the persistent, twisted style.

Common and locally abundant in Guatemala, and known from a single Mexican collection: *Pringle 8138*, from near Jalapa, Veracruz, Apr. 16, 1899 (F). Most collections were distributed as *C. thurberi*. Also known from the West Indies to Argentina.

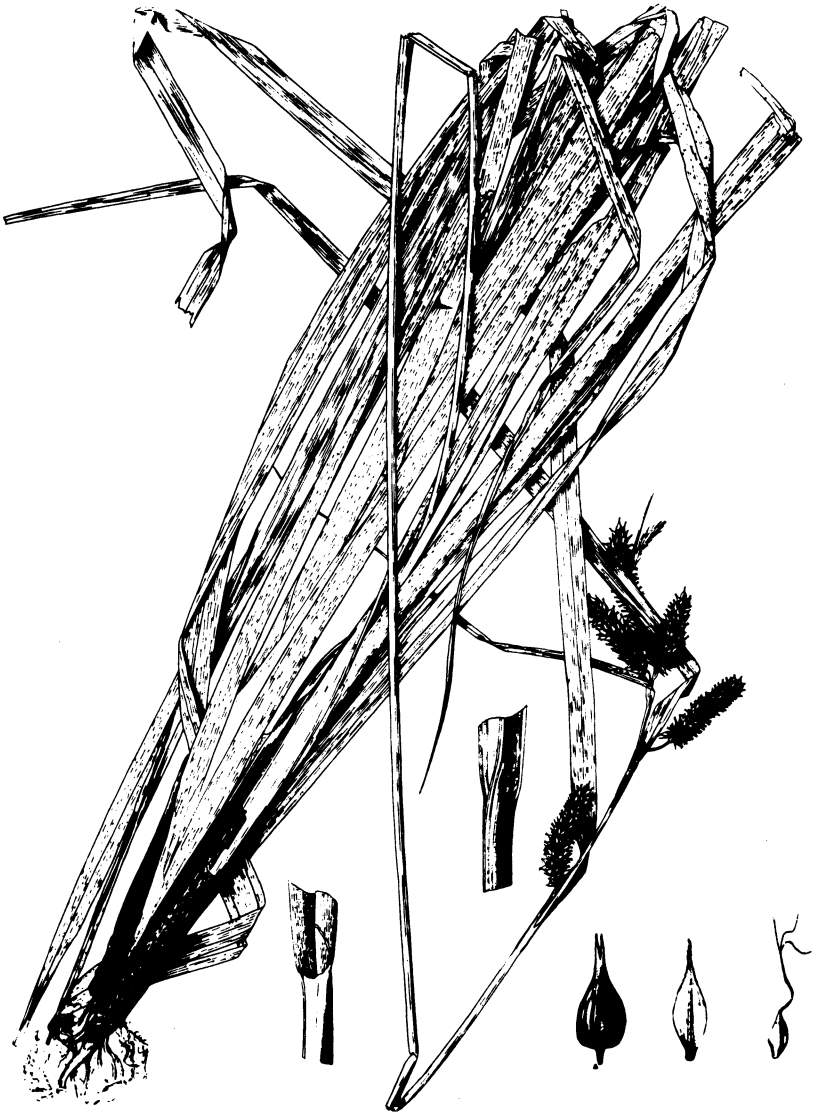


Plate 86. CAREX POLYSTICHA

30. § SQUARROSAE

87. *Carex frankii* Kunth (507)

Carex frankii Kunth, Enum. Pl. 2: 498. 1837.

C. stenolepis Torr., Ann. Lyc. N. Y. 3: 420. 1836, not Less. 1831.

Cespitose,, with short-ascending, tough stolons; *culms* 1–8 dm. high, stiff, stout, obtusely triquetrous, aphyllopodic, reddish-tinged at the base; *sterile shoots* elongate, leafy; leaves numerous, septate nodulose, the blades 2–6 dm. \times 3–10 mm., flat, firm, rough above and on the margins, the sheaths tight, yellowish-brown-tinged ventrally, truncate at the mouth, the ligule variable; *terminal spike* staminate, sometimes gynaeandrous or abortive; *lateral spikes* 3–7, pistillate, 1–4 cm. \times 8–12 mm., 40–120-flowered, stiff-peduncled, the rachis zigzag; *bracts* numerous, leaf-like; pistillate scales aristiform, green, three-nerved, setulose; *perigynia* 4–5 mm. long, 2–2.5 mm. wide, squarrose, inflated, the body strongly ob-conic, submembranaceous, glabrous, olive-green, strongly ribbed, the conic beak 1.5–2.5 mm. long, bidentate, the teeth stiff, 0.5 mm. long; *achenes* trigonous with blunt angles, 1.5 \times 1 mm., loosely enveloped, brownish-yellow, granular, substipitate, continuous with the persistent style.

Known in our area from a single collection: moist stream side, Canyon de Sentenela on Hacienda Piedra Blanca, Sierra del Carmen, Mun. de Villa Acuña, Coahuila, Mexico, *F. L. Wynd & C. H. Mueller* 550, July 6, 1936 (GH; US). Mexico and Texas to Georgia, northward to Pennsylvania, Maryland, Illinois, and Kansas.



Plate 87. CAREX FRANKII

31. § VESICARIAE

88. *Carex lurida* Wahl. (526)

Carex lurida Wahl., Sv. Vet.-Akad. Nya Handl. 24: 153. 1803.

Cespitose, from short, stout rootstocks; *culms* 1.5–10 dm. high, obtusely triquetrous, aphyllopodic, red-tinged at the base, the basal sheaths sparingly filamentose, the old leaves conspicuous; *leaves* with well-developed blades 3–6 to a fertile culm, the blades 1.5–4 dm. \times 2–7 mm., flat with revolute margins, firm, septate-nodulose, the mid- and lateral-nerves prominent above, roughened toward the attenuate apex, especially on the margins, the sheaths loose, hyaline ventrally, yellowish-brown-tinged, concave to truncate at the mouth, the ligule longer than wide; *terminal spike* staminate; *lateral spikes* 1–4, pistillate, 1–7.5 cm. \times 14–20 mm., 40–150-flowered, the lower sometimes drooping; *bracts* leaflike; *scales* rough-awned, yellowish-brown with hyaline margins and three-nerved lighter or green center; *perigynia* 6–9 mm. long, 2.5–3 mm. wide, spreading, the body ovoid or obovoid-globose, strongly inflated, membranaceous, yellowish-green or straw-colored, glossy, punctulate, strongly about 10-nerved, rounded and nearly sessile at the base, tapering or contracted into the smooth or roughish, slender, beak from one-half to nearly as long as the body, usually very unequally bidentate or obliquely cut at the mouth, the teeth slender, stiff, erect or somewhat spreading, 0.5–1 mm. long; *achenes* trigonous with blunt angles and concave sides, oval-obovoid, 2–2.5 \times 1.5 mm., densely granular, yellowish-brown, substipitate, loosely enveloped in the lower half of the perigynium-body, continuous with the persistent, twisted or very abruptly bent style.

Known in our area from only two collections, both from Mexico: swamps near Jalapa, 4,000 ft., Veracruz, *C. G. Pringle* 8160, July 17, 1899 (ENCB; F; GH; MICH; US); and, pine woods and sphagnum bogs ca. 3 mi. from Zacultipán on road to Tianguis-tengo, 7,000 ft., *H. E. Moore* 3329, July 4, 1947 (GH). Nova Scotia to Minnesota, southward to Florida, Texas, and Veracruz.



Plate 88. CAREX LURIDA

ADDENDA

After the completion of this manuscript, it was discovered that the Herbarium at the San Diego Natural History Museum contained specimens of the following six additional species from Mexico, all collected by Dr. Reid Moran in Baja California.

Carex alma Bailey (54)

This should come before *Carex agrostoides* Mack. (No. 8) in Section Multiflorae. It is distinguished from that species in having the perigynia broader, ovate or oblong-ovate, and sharp-margined only above, instead of to the rounded-truncate (rather than round-tapering) base, and blackish at maturity instead of straw-colored.

Its previously known range was southern California, eastward to southern Nevada and Arizona.

Occasional on streambank, valley in upper Arroyo Copal, Sierra San Pedro Mártir, *R. Moran 15472*, Aug. 25, 1968; wet crevices in granite, E. face of San Pedro Mártir, first pass S. of Cerro Venada Blanco, 8,700 ft., *R. Moran 15680*, Sept. 15, 1968; and, common along stream in steep-walled Canyon del Diablo, NW. of Picacho del Diablo, Sierra San Pedro Mártir, *K. L. Chambers 566*, June 14, 1954.

Carex subfusa W. Boott (139)

This species would key out to *C. subbracteata* var. *tolucensis* F. J. Herm. (No. 19) in Section Ouales, from which it differs conspicuously in its smaller perigynia (3–4 mm. long, 1–1.5 mm. wide, instead of 4.25–4.5 mm. long, 2.25 mm. wide).

Known previously from Oregon to southern California, eastward to Arizona.

Occasional in dry sand in meadow, 7,200 ft., La Encantada, *R. Moran & R. F. Thorne 14344*, Aug. 19, 1967, and, occasional on wet, sandy soil, La Concepción, 5,250 ft., Sierra San Pedro Mártir, *R. Moran 15045*, May 31, 1968.

Carex globosa Boott (225)

A member of Section Montanae, this species would key out to *Carex geophila* Mack. (No. 34). It differs principally in having the perigynia finely many-ribbed on the outer face, as well as strongly two-keeled, and the perigynium-beak 0.75–1.25 mm. long, instead of 0.5–0.75 mm.

Previously known from the coastal counties of California, from San Diego County northward to Sonoma County, and from the Santa Barbara Islands.

Fairly common in Coulter pinewood on upper north slope of Cerro Blanco, 3,900 ft., *R. Moran* 17592, May 24, 1970.

Carex lanuginosa Michx. (384)

A species of Section Hirtae, a section not otherwise known from our area. It would key out to Section Virescentes from which it differs in its septate-nodulose leaves. The style is jointed with the achene in Section Hirtae, but in *C. lanuginosa* it is almost imperceptibly so.

A very wide-ranging species previously known from New Brunswick to British Columbia, southward to Tennessee, Arkansas, Texas, New Mexico, and southern California.

In wet meadow, La Grulla, 3,600 ft., Sierra San Pedro Mártir, *R. Moran* & *R. F. Thorne* 14495, Aug. 22, 1967.

Carex senta Boott (461)

A member of Section Acutae, it keys out to *C. eurycarpa* Holm (No. 80), from which it differs in having the ligule longer than wide and the culms surrounded at the base by the dried leaves of the previous year.

Previously known from California and the mountains of Arizona.

Tussocks among rocks in stream, La Joya, in Valladares Creek, ca. 4,780 ft., Sierra San Pedro Mártir, *R. Moran* 17998, July 29, 1970.

Carex rostrata Stokes (520)

A member of Section Vesicariae, keying out to *Carex lurida* Wahl. (No. 88), from which it is at once distinguishable by the pistillate scales which lack the long, rough awns of that species.

One of the most widespread sedges, previously known from Greenland to Alaska, southward to Maryland, Indiana, South Dakota, New Mexico, and southern California, as well as Eurasia.

Abundant in wet meadow, La Grulla, ca. 3,600 ft., Sierra San Pedro Mártir, *R. Moran* & *R. F. Thorne* 14496, Aug. 22, 1967.

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GLOSSARY

Achene. A small, dry and hard, one-celled, one-seeded, indehiscent fruit.

Acicular. Needlelike.

Acuminate. Tapering to a gradual point.

Androgynous. Having the staminate flowers above the pistillate in the same spike.

Anther. The pollen-bearing part of the stamen.

Aphyllopodic. The lower leaves bladeless or nearly so.

Apiculate. Abruptly terminated in a small point.

Aristate. Awned; tipped with a bristle.

Attenuate. Slenderly tapering or prolonged; more gradual than acuminate.

Awn. A bristle-shaped appendage.

Beak. A firm, prolonged, slender tip.

Bi.- Latin prefix signifying two.

Bidentate. Having two teeth.

Bidentulate. Minutely bidentate.

Caducous. Falling off very early.

Canaliculate. Longitudinally channeled.

Capitate. Shaped like a head; collected into a head or dense cluster.

Castaneous. Chestnut-colored; dark-brown.

Cespitose. Growing in tufts.

Chartaceous. Having the texture of writing paper.

Ciliate. Marginally fringed with hairs.

Circinate. Coiled from the tip downward.

Clavate. Club-shaped; gradually thickened upward.

Conduplicate. Folded together lengthwise.

Coriaceous. Leathery in texture.

Corrugated. Wrinkled or in folds.

Culm. The type of hollow or pithy slender stem found in grasses and sedges.

Cuneate. Wedge-shaped; triangular, with the narrow part at the point of attachment.

Cuspidate. Tipped with a cusp, or sharp and firm point.

Deciduous. Not persistent; falling off.

Decompound. More than once compounded or divided.

Decurrent. Extending downward from the point of insertion.

Deflexed. Bent or turned abruptly downward.

Dioecious. Having staminate and pistillate flowers on different plants.

Divaricate. Widely divergent.

Dorsal. Pertaining to the back, or outer surface.

Elliptic. With the form of an ellipse, nearly oblong but widest in the center and with curving sides.

Emarginate. With a small notch at the apex.

Excurved. Curving outward or away from axis.

Fasciculate. In close bundles or clusters.

Filamentose. Composed of, or breaking up into, threads.

Filiform. Threadlike.

Flaccid. Without rigidity; lax and weak.

Flexuous. Zigzag.

Glabrous. Not pubescent or hairy.

Glaucous. With a bluish or whitish, waxy covering.

Globose. Spherical or rounded.

Gynaecandrous. Having the pistillate flowers above the staminate in the same spike.

Hispidulous. Minutely hispid (bristly-hairy).

Hyaline. Colorless or translucent, transparent.

Indehiscent. Remaining persistently closed.

Indurated. Hardened.

Inflorescence. The flower-cluster of a plant.

- Involute*. With the edges rolled inward, i.e., toward the upper side.
- Lacinate*. Cut into narrow lobes or segments.
- Lanceolate*. Narrow and tapering to the apex, broadest toward the base.
- Lenticular*. Lens-shaped.
- Ligule*. The thin, collar-shaped appendage on the inside of the leaf-blade at the junction with the sheath.
- Linear*. Long and narrow, with parallel sides.
- Membranaceous*. Thin, soft and pliable, like a membrane.
- Moniliform*. Resembling a string of beads.
- Mucronate*. With a short, abrupt tip.
- Ob-*. Latin prefix signifying the reverse or contrariwise.
- Obovate*. Inversely ovate.
- Obtuse*. Blunt or rounded at the end.
- Orbicular*. Circular.
- Ovate*. Flat and having the outline of an egg, broadest toward the base.
- Ovoid*. A three-dimensional figure, ovate in outline.
- Papillose*. Bearing minute nipple-shaped projections.
- Perigynium*. The inflated, saclike organ surrounding the ovary or achene in *Carex*.
- Persistent*. Long-continuous and remaining attached.
- Phyllopodic*. Having the lower leaves with well-developed blades.
- Pistil*. The seed-bearing organ of a flower, consisting usually of ovary, style, and stigma.
- Pistillate*. Provided with pistils.
- Plano-convex*. Flat on one surface, rounded on the other.
- Plicate*. Plaited; folded as a fan.
- Puberulent*. Minutely pubescent.
- Pubescent*. Covered with hairs, especially short, soft, and down-like.
- Pulverulent*. Powdered; appearing as if covered with minute grains of dust.
- Punctate*. Dotted with depressions or with translucent glands.
- Rachilla*. A small axis of an inflorescence.

Revolute. Rolled back from the margins or apex.

Rhizome (or rootstock). A prostrate, more or less elongate stem, partly or completely beneath the surface of the ground and usually rooting at the nodes.

Rugose. Wrinkled. *Rugulose*: the diminutive.

Scabridulous. Slightly rough.

Scabrous. Rough to the touch.

Septate. Divided by partitions.

Serrate. With small, sharp teeth pointing forward.

Serrulate. Minutely serrate.

Sessile. Not stalked.

Setaceous. Bristle-shaped.

Setose. Beset with bristles.

Sheath. The tubular basal part of a leaf that encloses the stem.

Spike. A simple inflorescence with the flowers sessile or nearly so on a more or less elongated rachis.

Squarrose. Spreading rigidly at right angles or more.

Squamiform. Scalelike.

Staminate. Having stamens only (pistils lacking).

Stigma. The apical part of the pistil on which the pollen is deposited and germinates.

Stipitate. Having a stipe or stalk.

Stoloniferous. Producing trailing shoots above ground, often rooting at the nodes.

Striate. Marked with fine longitudinal lines or streaks. *Striolate*: the diminutive.

Subulate. Awl-shaped; very narrow and tapering gradually from the base.

Sulcate. Longitudinally grooved or furrowed.

Terete. Circular in cross-section; cylindrical.

Trigonous. A three-dimensional figure, triangular in outline.

Truncate. Cut squarely across at the apex or base.

Ventral. Pertaining to the inner face of an organ, as opposed to dorsal.



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Accepted scientific names are in boldface italics;
synonyms in plain italics. Common and sectional
names are in Roman type.

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